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A SUCCESSFUL trial of the Sims-Edison electric torpedo was recently made at Willett's Point. As is well known, in this system the driving, steering and firing are effected through a single wire. The speed attained, with a current of 1,000 volts and 25 amperes, was estimated at 20 miles per hour, and a circular run of a mile was made. For the trial, a dummy weight of 250 pounds of gravel was substituted for the explosive. A larger torpedo to carry 400 pounds of dynamite and two miles of wire is being built.

The difficulty in arriving at a knowledge of the efficiency of modern engines of war is the great expense of experiment. In the case of automobile and dirigible torpedoes, a thorough test implies the destruction of the craft itself, as well as its target. Service in actual warfare will alone determine the effect of the numerous bloodthirsty but untried inventions of recent years; and military authorities can hardly be blamed for harboring a natural hankering to see how all these new things will turn out in practice. Of the automobile torpedoes, the Whitehead alone has seen service, and even its capabilities are still open to conjecture.

WHETHER the present crusade against the New York Steam Company is entirely justifiable is something that we will not attempt to determine. The charge that it is a nuisance which ought to be suppressed will probably have to be settled by the courts. There is something to be said on either side. The company's system has been an undoubted convenience to many steam users; but on the other hand there must be something radically wrong about it, judging from the frequent accidents which have occurred, and it seems probable that as the service pipes and connections deteriorate with age such accidents will be even more frequent, unless remedies are introduced by the company or the law intervenes.

The distance to which steam can be safely and economically sent from main supply centers, with available non-conductors and means of making joints, is no doubt less than was estimated. By establishing more boiler stations and conveying steam over smaller areas some of the objections to the system might be eliminated, though a part of the economy of concentrated boiler batteries would be lost. For example, a boiler plant in each block could supply heat and power to all the buildings of that block, and the steam-pipes would cross no streets and need not interfere with the gas mains.

ARE tornadoes becoming more frequent and more violent in this country? Certainly the number reported and the amount of damage done are increasing, so that we are becoming accustomed to expect reports of them almost any day during the tornado season. The disastrous one recently in Minnesota was rather by the accident of location than by force of wind, marked out from the many recently occurring. It is difficult to make comparisons of relative frequency at different times, since the tornado area has not been populated long enough. The rapidly increasing exposures of life and property and the more perfect system of collecting and publishing the news naturally give more prominence year by year to these phenomena. But it is quite possible that formerly, before the country was so thickly settled as at present, there may have been just as many tornados in a given period and space as now—only, of course, fewer of them happened to do damage and were reported. Climatic changes are undoubtedly going on, and in a small measure are accounted for by the destruction of the forests, the plowing of land, the influence of railroad tracks and telegraph wires, etc.; but while there is no great mystery about the proximate causes of tornados, there is left a large field for speculation and study as to their prime origin. Thus far very imperfect success has attended attempts to predict them, though warning of the larger rotary storms, the cyclones, is sometimes possible.

ENGINEERING NON-PROGRESS.

It is customary in the annual addresses by the presidents of our several engineering societies to review the progress of engineering science and art, and such addresses usually consist to a large extent of records of advances and achievements. The address of President SHINN, of the American Society of Civil Engineers, at the recent convention at Cresson, was no exception, but portions of the address call attention to certain branches in which there has been no progress at all; and in this the address is somewhat novel.

In railway management the average movement of freight cars was stated by Mr. SHINN to have made no improvement in recent years. A freight car is moved, on an average, about 25 miles per day, equal to two and one-half hours of actual movement. That is, it stands idle nine days for every day it is in motion. The increase in the number of tons of freight ransported for 1888, as compared with 1882, is 63 per cent., while the increase in the number of cars is about 48 per cent. Considering that during that period the average capacity of cars has increased by about one-half, it shows no improvement in the use of cars.

In regard to the train service, he says that, with all the improvements that have been made, there is less regularity in train service at this time than there was twenty years ago; the fact being particularly due to the high speed schedule. The plain remedy is, if the train cannot make the schedule time, the schedule should be made to fit the train.

Concerning common roads, Mr. SHINN says that no worse ones can be found in any civilized country. On some of our public roads a full load can be hauled only three months out of the twelve; a two-thirds load during three more, and a half load during the remaining six. In many sections of the country business was completely paralyzed last winter by the impassable condition of the roads, owing to the absence of cold weather.

We commend this method of noticing in such addresses the non-progress in engineering matters, to the presidents of other engineering societies By thus calling attention to "long-felt wants," they may stimulate engineers to make advances in the directions indicated.

THE CENSUS OF GOLD AND SILVER MINES.

The work of collecting the statistics of gold and silver mines of the country is now in rapid progress. Nearly 4,000 schedules have been received from the mines, some of them containing statistics of groups of several mines worked by one corporation. Of course a large number of these were from mines which did not produce in 1889, but as they may be put in operation soon, statistics are being collected of the valuation of their buildings, machinery, etc. As stated in our article on this subject in our issue of June 7th, the greater part of the work has been done by correspondence from the office of the special agent in New York. Schedules were sent to all mines whose names and addresses could be obtained, and if their replies were not received within a reasonable time duplicates were sent, stamped "Second request; prompt attention is desired." The results of the second request have been, on the whole, extremely gratifying, and schedules are now being received daily in great numbers.

To insure, however, a more complete report from each district than could be got by correspondence alone, special agents have been appointed in all the mining States, who are now engaged in supplementing the work done by correspondence. The names of the principal special agents are as follows:

For Alaska, J. H. BURFEIND, Douglas Island, Alaska; Virginia, North Carolina, South Carolina, Georgia and Alabama, Mr. STUART W. CRAMER, assayer in charge of the United States Mint at Charlotte, N. C.; Arizona, Mohave County, Mr. JOHN F. BLANDY, of Prescott; Yavapai County, Mr. WILLIAM O. O'NEILL, of Prescott; the remainder of Arizona, Mr. S. C. BAGG, of Tombstone; California, Mr. CHAS. G. YALE, editor of the *Mining and Scientific Press*, San Francisco; Colorado, Boulder County, Mr. HENRY FULTON, of Boulder; Rio Grande, Conejos and Saguache, Mr. CARL WULSTEN; the State of Colorado, Southern Idaho and Nevada, Mr. FREDERICK F. CHISOLM, of Denver; sub-agent in Southern Idaho Mr. J. S. CHILDS, of Hailey; Montana and Northern Idaho, Mr. SPRUILLE BRADEN, assayer in charge of the United States Mint, Helena, Mont.; Michigan, Mr. F. B. PHELPS, of Hancock; Nevada, Washoe, Storey, Esmeralda and Nye counties, Mr. JAMES DELAVAN, of Virginia City; the remainder of Nevada, Mr. H. R. WAGNER, Eureka, both reporting to Mr. CHISOLM at Denver; New Mexico, Mr. J. R. JOHNSON, of Silver City; Oregon and Washington, Mr. WILLIAM HUNTLEY HAMPTON, of Portland, Ore.; South Dakota, Mr. JAMES LONG, JR., of Rapid City; Texas, Mr. E. W. PARKER, of Washington, D. C., now in Texas; Utah, Mr. W. G. VAN HORN, Secretary of the Ore Producers' Association, Salt Lake City; Wyoming, Mr. R. W. BURKHARDT, of Laramie City.

Mr. R. P. ROTHWELL, special agent in charge, is now traveling through the West visiting the different sub-agents and making all necessary arrangements to insure the full and accurate completion of the work. His address until August 1st will be Phœnix, Ariz.

In the New York office at 27 Park place a large corps of clerks is engaged in compiling the schedules as fast as they arrive, and in carrying on the correspondence made necessary by the imperfect shape in which many of them are returned.

Nothing can, as yet, be said concerning the totals of any of the districts, for the reason that in none of them is the work yet sufficiently advanced. Mine owners who have not already sent in their schedules are earnestly requested to delay them no longer, as such delay will interfere with the prompt compiling of the summary of their district. As printed on every schedule, the information received is used only in making aggregates, and therefore cannot possibly embarrass or injure the party giving it. Editors of newspapers in the several mining districts are especially requested to urge upon every mine owner or manager the great importance of giving accurate and full replies to questions on the census schedules.

Communications in regard to the census should be addressed to R. P. Rothwell, Special Agent, 27 Park Place, New York.

KEELY'S DISCOVERY AND CONTROL OF "THE WILL FORCE OF THE ALMIGHTY."

In *Lippencott's Magazine* for July Mrs. BLOOMFIELD-MOORE publishes an elaborate defense of Keeley-Motor KEELY, under the title of "KEELY'S contributions to Science," or "What has KEELY done for Science?" The answer to the question is somewhat obscure, depending on what KEELY says he has done, and in a domain of science which he says no one but himself has ever investigated or has any knowledge of, and which no fellow, not even KEELY himself, can find out or understand. Scientists generally are urged to exercise charity and patience and not denounce as charlatanism or humbug the claims of KEELY that he has found out nature's ultimate secret, and that if the world will have patience and contribute to the expenses of investigation and if time holds out he will explain in language that common mortals can understand what these secrets are.

We are told that "KEELY has written three treatises to explain his system:"

"I. Theoretical Exposé or Philosophical Analysis of Vibro-Molecular, Vibro-Atomic and Sympathetic Vibro-Etheric Forces, as applied to induce Mechanical Rotation by Negative Sympathetic Attraction.

"II. Explanatory Analysis of Vibro-Acoustic Mechanism in all its Different Groupings or Combinations to induce Propulsion and Attraction (sympathetically) by the Power of Sound-Force; as also the Different Conditions of Intensity, both Positive and Negative, on the Progressive Octaves to Ozonic Liberation and Luminosity.

"III. The Determining Principle of Matter or the Connective Link between the Finite and the Infinite, progressively considered from the Crude Molecular to the Compound Inter-Etheric; showing the Control of Spirit over Matter in all the Variations of Mass-Chords and Molecular Groupings, both Physical and Mechanical."

But the apparently inspired author (inspired by KEELY) of the magazine article kindly or warningly adds that if these treatises were read from the first page to the last by men of science they would not be understood.

If KEELY in all the years since 1872 has not done anything that has convinced a single scientific seeker after truth that he has actually discovered anything, and if his descriptions of what he claims to have found are unintelligible to the rest of mankind the answer to the conundrum becomes simply a question of pure faith in KEELY'S assertions. There have been many important discoveries in the present century, and though their first announcement may have been received with incredulity by some, the discoverers have had no difficulty in demonstrating the new facts in a manner that carried conviction, and easily described them in language that their fellow men could understand.

There is no sense in mystifying things and calling gravity "transmittive inter-etheric force under immense etheric vibration" at least until he knows enough about "etheric force" and "etheric vibration" to be able to tell others intelligibly what they are or what he thinks they are.

When KEELY first announced his wonderful discovery which defies language to describe, he was much more modest; he had then a practical motive power generated in a mysterious manner, but he made no claim to the discovery of the "dominion of spirit over matter" as his "system." Now we are told in this apparently official description of his theories that

> Keely's researches in this province have shown him that it is neither the electric nor the magnetic flow, but the etheric, which sends its current along our nerves; that the electric and magnetic flows bear but an infinitely small ratio to the etheric flow, both as to velocity and tenuity; that true coincidents can exist between any mediums—cartilage to steel, steel to wood, wood to stone, and stone to cartilage; that the same influence, sympathetic association, which governs all the solids holds the same control over all liquids, and again from liquid to solid, embracing the three kingdoms, animal, vegetable and mineral; that the action of mind over matter thoroughly substantiates these incontrovertible laws of sympathetic etheric influence; that the only true medium which exists in nature is the sympathetic flow emanating from the normal human brain, governing correctly the graduating and setting-up of the true sympathetic vibratory positions in machinery, necessary to commercial success; that these flows come in on the order of the fifth and seventh positions of atomic subdivision, compound inter-etheric sympathy a resultant of this subdivision; that if metallic mediums are brought under the influence of this sympathetic flow they become organisms which carry the same influence with them that the human brain does over living physical positions, and that the composition of metallic and that of physical organisms are one and the same thing, although the molecular arrangement of the physical may be entirely opposite to the metallic on their aggregations; that the harmonious chords induced by sympathetic positive vibration permeate the molecules in each, notwithstanding, and bring about the perfect equation of any differentiation that may exist,—in one the same as in the other,—and thus they become one and the same medium for sympathetic transmission; that the etheric (or mind) flow is of a tenuity coincident to the condition governing the seventh subdivision of matter, a condition of subtlety that readily and instantaneously permeates all forms of aggregated matter, from air to solid hammered steel, the velocity of the permeation being the same with the one as with the other; that the tenuity of the etheric flow is so infinitely fine that a magnifying glass, the power of which would enlarge the smallest grain of sand to the size af the sun, brought to bear upon it would not make its structure visible to us; and that, light traversing space at the speed of two hundred thousand miles per second, a distance requiring light a thousand centuries to reach would be traversed by the etheric flow in an indefinite fragment of a second.

Nearly every one will regretfully agree with Mrs. MOORE that "history will determine whether KEELY is a man of genius or a charlatan." It is, however, a great pity that if KEELY be "a man of genius" and not also "a charlatan," he has not been able to demonstrate his claims or convince a larger number of those who have endeavored to examine his so-called discoveries. It is very frankly admitted that KEELY "has done nothing for commerce," though it was with statements that he had discovered a controllable economic force that could immediately be harnessed for the use of man, that he beguiled his credulous stockholders out of their good dollars and accumulated them for himself. We rejoice to hear that "Mr. KEELY'S work of evolution has at last reached the point where he is able to convince those scientists of his integrity, whose minds are broad enough" to receive the truth even if opposed to preconceived notions. A man's "integrity," however, should never be a matter of doubt, and it is certainly unfortunate for KEELY, and greatly retards the acceptance of his statements, that "when suspected of fraud he acts as if he were a fraud."

There are very few modern men of science who would be unwilling to believe in any real discovery, however it might at first appear to contradict preconceived notions. What the world wants is the truth. The ENGINEERING AND MINING JOURNAL, as the mouthpiece of enlightened science, would gladly welcome the proof of the discovery of such a force as KEELY has so long claimed to have controlled and would ungrudgingly accord the discoverer the very highest honors. We have no "preconceived notions" on the subject of the possibility of there being an "etheric force" or "the all-pervading Will-Force of the Almighty," if he prefers to call it this, but we have a "preconceived notion" that an honest investigator, or

discoverer of even almost incredible things, has no need of acting "as if he were a fraud" when announcing his discovery. The seeker after truth is anxious to have the whole truth made known; there is no necessity for concealing it in the disguise of the charlatan in this enlightened age.

Mrs. MOORE or KEELY explains: "The Duke of Argyll says, 'We know nothing of the ultimate seat of force. Science, in the modern doctrine of the conservation of energy and the convertibility of forces, is already getting something like a firm hold of the idea that all kinds of forces are but forms or manifestations of some one central force, arising from one fountain-head of power.'

"KEELY'S researches have taught him that this one fountain-head is none other than the omnipotent and all-pervading Will-Force of the Almighty, which creates, upholds, guides and governs the universe."

Now there is no inquisition to burn or torture KEELY for saying that he has searched out the Almighty and has harnessed His Will-Force for the use of man, but something more than mere assertion, whether of KEELY or Mrs. MOORE, is necessary to convince scientists or the rest of mankind that these claims are well founded.

FIREPROOF BUILDINGS.

By our Special Contributor.

Mr. Edward Atkinson, in an excellent letter to the *Evening Post*, called out by the recent fire in the Western Union Telegraph building, observes that the instances of most complete destruction by fire which he has known have been conflagrations in fireproof buildings.

This is undoubtedly true in general experience. The most complete fireproof structure of human manufacture is a stove or a furnace, and a fireproof building becomes nothing else than a furnace, if it be filled with fuel and supplied with a draught. In innumerable instances, the fuel is abundantly provided in the form of wooden wainscoting, flooring, casings, etc., oiled or varnished to promote kindling, wooden furniture, and accumulated papers or other rubbish. The draught is furnished by the high building, acting more powerfully because offering in halls and stairways a larger cross-section of air-passage than any chimney. And too often every facility is given by the internal arrangements and the construction of floors and walls for the rapid spread from story to story of a fire once started.

Mr. Atkinson touched upon many important points with regard to the proper protection of some so-called fireproof buildings against fire. But his most important suggestion is that the owners of such buildings should have rigorous expert inspection made, in the light of every such occurrence as the Western Union fire, to determine whether there are weak points in their own arrangements which can receive a timely reinforcement. He thinks they would be in most cases surprised to find what elements of peril they are unconsciously harboring in their fancied security. And he is undoubtedly right in that belief. R. W. R.

THE HOLLEY MEMORIAL.

By Our Special Contributor.

The memorial to be erected in this city in honor of Alexander Lyman Holley is so far advanced as to assure its completion before the time appointed for its public dedication, which is to take place early in October, during the New York meeting of the British Iron and Steel Institute. The site fixed for the memorial by the Park Commissioners is an admirable one, in Washington Square, and there, of course, the ceremony of unveiling the bust will take place; but the commemorative address of the occasion will be delivered before the open-air ceremony, in Chickering Hall, which has been engaged by the Institute of Mining Engineers for all the sessions of both societies in this city. This is a wise arrangement. The delivery of an address out of doors is under all circumstances an unsatisfactory business for the audience as well as the orator. In the daytime and in the midst of the traffic and bustle of a metropolis, it would be more than usually laborious and ineffective.

The joint committee of the Civil, Mechanical and Mining Engineers having this matter in charge has invited Mr. James Dredge, editor of London *Engineering*, to deliver the address, and it is understood that he has accepted the appointment. A better choice certainly could not have been made. Mr. Dredge will bring to this congenial task a thorough acquaintance with the history of progress in those branches of engineering science which Holley so greatly advanced and so brilliantly adorned. It has been his business as a technical journalist to note the successive steps of their wonderful advance, and to measure the achievements of the individual leaders as well as the conquests of the armies they have directed and inspired. The theme is a grand one, for it so happens that the period and the sphere of Holley's professional career present developments unequaled for far-reaching effects by any other quarter of a century or any other departments of human industry since civilization began.

It was in this period, and in the domain of mechanical engineering (in its widest sense), that all the great inventions of the preceding century suddenly came to full harvest. Railways, stationary and marine steam engines, high explosives and heavy artillery and armor, and above all, the manufacture of steel on a vast scale as a structural material, all burst into bloom and fruit, revolutionizing the conditions of commerce, industry and war, and inaugurating a new era, in which for the first time, whatever pessimists or agitators may say, the dominant tendencies are for peace, the rewards of labor are steadily increasing, and the world, which had previously produced little more than would feed and clothe its inhabitants, is making all civilized nations rich.

But besides the ability to grasp this great subject, and the critical perception of its relations to the individual career which he is called more particularly to characterize, Mr. Dredge possesses a qualification which renders him a welcome as well as competent orator for this ocasion. No one who knew Holley could fail to know that James Dredge was one of his most loyal and well-beloved friends. It was at the house of Mr. Dredge that he was nursed back to life from the first attack of the disease which after another year proved fatal.

The occasion is an international one. The memorial itself is a testimony from engineers of both hemispheres. Its dedication will be graced with the presence of hundreds of guests from beyond sea. We Americans have had other opportunities to express our appreciation of the character and career of our great countryman. What voice could now be more fitly heard than that of an Englishman, who is a distinguished engineer, a critic of authority, and who was Holley's friend?

R. W. R.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.

The Darby Process.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In reply to Mr. Howe's remarks in your issue of the 19th inst. I have to say the following:

I do not believe that, under the most favorable conditions (*i. e.*, making allowance for the already mentioned subsidiary reactions), more than two-thirds of the filter-carbon can become combined with the molten metal, nor do I believe that it is practicable to enrich the metal with more than about 0·2 per cent. of carbon by mere carbon-filtering.

The results of every new steel making process since the time of Uchatius (his process being the first one I can speak of from personal recollection) at first have been exaggerated. Sir Henry Bessemer could not bessemerize successfully until he had learned from Mushet; the Martin Brothers, of Sireuil, could not "martinize" until Siemens introduced his regenerator, by the aid of which a puddling furnace can be made sufficiently hot to render "iron that has come to nature" perfectly fluid; if the regenerator had been known before, then the invention of the open-hearth steel process would, in all probability, have preceded that of the Bessemer process; and if Darby had first tried his device on overblown basic converter steel, he probably would have tumbled at once into the true mission of "darbyfying," *i. e.* carburizing oxidized metal to a very limited extent, instead of scaring some crucible steel-makers out of their wits by asserting that carbon-filtering will produce steel containing 0·91 per cent.—if not more—of carbon. I say scaring "some," for most of the crucible steel-makers do not yield to panicky feelings when a new process is announced which is "bound to revolutionize the industry." They have been there before.

Another advantage of Darby's process is, probably, that steel containing no oxygen can be freed from gases, by filtering over carbon, without becoming oxidized, or without losing carbon, by the filtering. Now, I think that is glory enough for Darby, the more so as he came very near being deprived of it by a German professor. The "G. P." modestly claims (according to his own statement, which is now making the round of the technical periodicals) that he had thought about the matter and had already made private suggestions in regard to it about the same time that Darby patented it, and in order to substantiate his claim to recognition (not as a patentee, but as a suggestor of valuable improvements) he divulges the bottom facts, on which he has built his theory, as follows:

"That this be possible (the dissolution of carbon in molten iron) could not be doubted. Aside from other practical demonstrations, it is proved by the following: The collection of minerals of the School of Mines at Leoben (Styria) contains a piece of white pig iron, the interior of which has been *changed* by an accidentally inclosed piece of coal—within a circumference of about three centimeters—to spiegel iron, which adheres almost tightly to the small remnant of the coal, and thus furnishes the proof that the coal must have been absorbed very quickly by the iron while the latter was in the fluid state." Now, it seems to me that an ordinary human being, having the knowledge that Styria is rather noted for its production of spiegel iron for primitive blast furnaces and other relics (for the latter the ancient town of Leoben in particular), might be innocent enough to suppose that a piece of spiegel iron got into the burden from which said particular piece of white pig iron was obtained; that it had not time to melt away entirely before the iron was tapped, and that it is nothing uncommon for a piece of spiegel iron to contain remnants of coal or carbonized wood. But, then, as long as metallurgists will persist in trying to explain comparatively simple reactions by the aid of $x + y$ formulæ, such exhibitions of extraordinary perspicuity as that specimen at Leoben has given rise to in scientific circles must needs continue to enrich our technical literature with—scientific ballast.

To return to Mr. Howe's friendly objections (I consider them as such because Howe exposes the vulnerable points of his metallurgy without reserve), I do not want to pass by the fact that "perfectly reduced iron sponge, when exposed to a current of carbonic oxide, later gave up 0·84 per cent. of oxygen to a stream of hydrogen." If the conditions under which said experiment was made are stated in detail, it will probably be found that said conditions favored the deposition of carbon, viz. $2\,CO = CO_2 + C$, and the subsequent oxidation of the sponge, viz. $Fe + CO_2 = FeO + CO$, the sponge oxidizing at a lower temperature than that at which CO could reduce the newly formed FeO.

As to the further fact, "that a rapid stream of carbonic oxide turned iron wire blue and straw color," I only want to call attention to the infinitesimally small proportion of O, or of CO_2, that would accomplish such a result. Why should this small quantity of atmospheric O not have been sucked up, on the injector principle?

Those who still believe in direct carburization, I refer to the tests made by Prof. A. Ledebur on the behavior of wrought iron, pig iron, Thomas steel and cast steel when heated in wood charcoal (see ENGINEERING AND MINING JOURNAL of August 27th, 1887) and to the data given in Howe's Metallurgy on the absorption of carbon by crucible steel. All of the data which bear on this subject give the impression—if direct carburization is to be assumed to take place—that there is some undefinable and unaccountable limit to that kind of absorption, and that this limit always falls short of the degree of carburization that can be easily produced by mixing, for instance, equal portions of pig iron containing, say, four per cent. of carbon, and of steel containing, say, one per cent The result of such mixture can be made to approach very nearly the average, *i. e.*,

2½ per cent., and you may halve that by adding the less carbonaceous metal in corresponding proportions.

Why is it that in all cases of assumed direct carburization no such proportion as 1½ per cent. has ever been reached, though carbon has been added in superabundance, and why is it that all determinations that have been verified by frequent tests, and by different investigators, exhibit no greater percentage of carbon-absorption than can be readily explained to be the result of indirect combination?

My own answer to this query is: That most of the observations on supposed direct carburization (on the melting of carbon in molten iron, as it were) have been made at a time when the effects of the subtle but rapid permeation of gases, through the pores of highly heated solids, were not yet fully appreciated, and before the still more recent researches, on the quantities of gas that remain occluded in coke and in carbonized fuel, had been made or published.

A. D. ELBERS.

HOBOKEN, N. J., July 21st, 1890.

NEW PUBLICATIONS.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in the Journal.]

Derivation of Practical Electrical Units. By Lieut. F. B. Badt and Prof. H. S. Carhart. Published by Electrician Publishing Company, Chicago, Ill., 1890. Pages, 56. Illustrated.

The Elements of Machine Design. Part I. General Principles, Fastening, and Transmissive Machinery. By W. Cawthorne Unwin, F. R. S. Published by Longmans, Green & Co., New York, 1890. Pages 456. Price $2.00. Illustrated.

TRANSVAALITE—A NEW COBALT MINERAL.

By Thos. B. McGhie and John Clark, Ph.D.

In 1889 Mr. McGhie, who had occasion to be in the Transvaal, took the opportunity of paying a visit to a cobalt mine about 30 miles north of Middleburg, and brought away with him a number of specimens.

The ore of this mine, which consists essentially of arsenide of cobalt or smaltine, occurs in a vein of quartzite, and was worked for several years, when it was abandoned, owing, probably, to the cost of transit and the difficulty of separating the ore from its matrix.

A sample of this ore was found on analysis to have the following composition:

	Per cent.		
Arsenide of cobalt	57·39	Siliceous matter	30·55
Arseniate of cobalt	8·27	Combined water	1·46
Sulphide of cobalt	1·02	Moisture	0·52
Sulphide of nickel	0·38	Total	99·59

From the above analysis it will be observed that the ore itself, apart from the matrix, is remarkably pure, but although the vein at some parts is several inches in thickness, the greater part of the ore is distributed throughout the matrix in such manner that it can only be separated by washing appliances.

The specimens on the table show the appearance of the ore at different parts of the vein.

In the same rock, at a short distance from the vein of arsenide, there is another vein of a different kind of cobalt ore, varying in width from about two inches to a thin streak, which we understand, was followed for a short distance in search of gold, and then abandoned. This is the mineral which forms the subject of our communication. Where the vein is wide the ore is black in color, with reddish-brown patches, and somewhat nodular in its external appearance, but where the vein is thin the ore is black, and has a slaty fracture. It dissolves in hydrochloric acid readily, with the evolution of a great deal of chlorine, and gives a solution which is bluish-green when concentrated, but pink when diluted.

The nodular portion, of which I show you a specimen, and of which the greater part of the sample was composed, was found on analysis to have the following composition:

	Per cent.		Per cent.
Sesquioxide of cobalt	65·80	Cobalt	49·54
Protoxide of cobalt	3·82	Specific gravity	3·846
Oxide of nickel	0·15	Hardness	4·0
Arsenic acid	5·79	Streak	Brownish black.
Sesquioxide of iron	2·41		Per ton.
Alumina	2·68	Gold	1 oz. 12 dwt.
Lime	0·40		
Magnesia	0 30		
Silica	6·35		
Water	12·19		
	99·89		

The percentage of sesquioxide of cobalt was determined from the chlorine envolved by heating with HCl, and found to be equivalent to 6·42 per cent. of oxygen, which has been assumed to be in the form of Co_2O_3, and the water was ascertained by igniting a weighed portion of the mineral and deducting the oxygen given off from the loss.

The results which we have obtained indicate that this mineral is essentially a hydrated sesquioxide of cobalt with 7·72 of arseniate of cobalt ($3\,CoO, AS_2O_5$), and if the oxide of iron exists in the form of hydrated arseniate of iron, which is probably the case, there is just about enough arsenic acid remaining, after calculating the protoxide of cobalt to arseniate, to form $2\,Fe_2O_3, AS_2O_5$ (iron sinter).

3·82 of CoO requires	3·90	AS_2O
2.41 " Fe_2O_3 "	1·73	"
	5·63	"

With the exception of wad, or earthy cobalt ore, which is regarded as consisting essentially of CoO, MnO_2, the only known cobalt mineral which so far as we are aware resembles Transvaalite is Heubachite, a natural hydrated oxide of cobalt and nickel, described by F. Sandberger in 1877 (Journ. Chem. Soc., Vol. II., p. 855) as having the following composition:

	Per cent.		Per cent.
CoO	65·50	MnO_2	1·50
NiO	14·50	H_2O	12·59
Fe_2O_3	5·13		99·22

Specific gravity, 3·44; hardness, 2·5.—*Jour. Soc. Chem., Ind.*

MINE OWNERS AND ENGINEERS OF JOPLIN, JASPER COUNTY, MO.

The group which we illustrate represents but a few of Joplin's prominent mine operators and best known mining engineers. The faces of some can readily be recognized by any one who has ever visited this prosperous lead and zinc mining district as the pioneers of the now flourishing city and its mines. The group and early history of the place would be incomplete without Patrick Murphy, the founder of Joplin, he having laid out the first forty acres west of Joplin Creek in the fall of 1871, calling it Murphysburgh, where he erected the first business building at what is now the northeast corner of First and Maine street. In 1877 he opened the first bank on his own account, but was soon joined in the business by Messrs. Toodle, Hannah and Brewster. In 1879 the bank was incorporated under the state laws of Missouri as the Miners Bank, with a capital stock of $25,000, with Patrick Murphy as president. The bank is now, and always has been, one of Joplin's solid financial institutions. Mr: Murphy also built the first zinc smelter in 1882; in brief, he has been at the head or in some way connected with almost everything of a public nature tending to the benefit of the city. Space will not permit a personal review of each individual in the group, but as we have mentioned the pioneer by name we gladly indicate his portrait. He is the gentleman in his shirt sleeves, sitting in a chair on the left.

The first lead mine in Southwest Missouri is said to have been opened in 1848, at Leadville, two miles east of Joplin The first discovery of lead within the limits of the present city is said to have been made by Daniel Campbell in 1849. Two years later lead ore was discovered at Oronogo, and mining was carried on to a considerable extent previous to the war. But the discoveries which have brought this district into prominence were not made until about 20 years ago, when two prospectors, J. B. Sargent and E. R. Moffett, started out on a prospecting tour, and finally pitched their tent on the east bank of Joplin Creek, just north of what is now Broadway in the city. They commenced digging in a little bluff east of the creek; as a result of their labor, they were soon rewarded by finding cubes of lead in large quantities, almost under the grass roots and down to depths of 35 and 40 feet.

This work was done by Moffet and Sargent in the month of August 1870. As the development work was continued the crude ore was piled up, owing to the lack of transportation, and as a matter of necessity they were compelled to build a reverberatory furnace in order to smelt the crude ore and reduce it to lead. In the summer of 1871, they kept four furnaces running night and day smelting the ore, for which they found a ready cash market in St. Louis. As the lead mines were developed down to the depth of from 35 to 40 feet, the miners found large deposits of a foreign matter oftentimes intermingled with the lead. Owing to the resinous appearance of the stuff it was given the name of resin tiff. Sometimes it would have a coal black lustre, and it was then called black jack. This stuff was the curse of the miner, and many lead mines were abandoned on account of it. New prospects were continually opened up on Joplin and Turkey creeks, but the resin tiff was always to be found. In July, 1874, Messrs. Ed Porter and Patrick Murphy determined to ship a car load of the resin tiff to Matthieson & Hegler's zinc works at La Salle, Ill., and have it tested in order to ascertain whether or not it had any commercial value. The smelter showed a net return of $15 for the car load, and disclosed that the tiff was a high grade of zinc ores. Buyers came to Joplin and purchaeed the tiff ore at from $3 to $5 per ton, and the miners commenced to save it. The demand increased as the mines and grade of the ore became known, and prices advanced to $7 and $8 per ton. Soon $12 was paid and then $15. The miners then commenced operating for zinc, and abandoned lead mines were reopened for the zinc ore they contained. The zinc industry has since constantly grown in importance until now jack is king.

The group is taken as will be seen in front of the office of Messrs. Holibaugh & Van Ness, Civil and Mining Engineers, the former of whom, Mr. J. R. Holibaugh is, the special correspondent of the ENGINEERING AND MINING JOURNAL in the district.

THE FUTURE OF NEW YORK.

Written for the Engineering and Mining Journal by William Kent, M. E.

The preliminary estimates made from the Census returns, which give New York City a population of over 1,500,000 and Brooklyn over 800,000, confirm the impression that has long been gaining ground, that New York and the cities immediately adjoining it are destined to form a metropolis which will eventually have a larger population than any other city in the world. Already a commission is studying the question of the consolidation of the two cities named, together with adjoining suburban towns, under one political government, but whether such consolidation be effected or not, the great city and its environs already constitute one city for the purposes of business and residence.

The causes which have contributed to make the metropolis what it is and which will inevitably continue to act and cause a still greater growth in the future are manifold. Chief of all is its unequaled geographical situation, a magnificent harbor, with its two great rivers and the water route to the West through the Hudson River and the Erie Canal. This insures its being the chief port of entry for both foreign and coastwise commerce, and if the city had no other advantages, this alone would cause it to become a great seaport, like Liverpool. It is also, however, the principal railroad center of the East, and this advantage causes the location here of a vast mercantile population that handles domestic products as well as foreign. It makes it a great buyers' headquarters, so that there is an increasing tendency of all large manufacturing and commercial enterprises wherever located, to establish here their offices and agencies.

Within the last twenty years also there has been an enormous development of manufacturing industries in and near the city, as it has been discovered that the city has many advantages over New England for such industries, being nearer to supplies of coal and iron, nearer to the great western and southern markets, and what is of increasing importance, nearer to the great market which is furnished by New York City itself and its near surroundings.

The banking, insurance, railroad, loan and trust, and other financial

institutions, the extent of which places New York far in advance of all other American cities as a money center, support a large fraction of the population, and attract hither an ever-increasing number of wealthy men from other parts of the country to make the city their permanent residence. The city is also rapidly growing as a place of the highest culture. Literature, education, architecture and the fine arts here find their highest expression, and the reproach that the American is an inartistic nation soon no longer be applicable to this part of the country at least.

As a place of residence all the year round, taking everything into consideration, New York and its surroundings are not excelled in this country. Other cities may be more beautiful, some may have a lower death rate, some may be better governed, but with all its defects it is rare to find a New Yorker who would be content to live in any other city, while thousands leave other cities to come to New York as a matter of choice. It is as common as a proverb to hear the expression from old travelers who have visited the principal cities both here and abroad, "Well, New York is good enough for me; no other place is equal to it."

There is therefore no reason to doubt that New York will continue to grow as it has grown in the past, and the probability is that it will eventually become the metropolis of the world.

In what manner it shall grow is one of the problems of the time which it behooves every one interested in its future to consider. The problem is largely one of engineering. The highest engineering skill the world has ever seen will be needed in the development of the future city, and it is needed in the immediate present to solve some of the greatest difficulties with which engineers have ever had to cope. It is of these difficulties and their possible solution that we now treat.

A most notable tendency which has been developed in New York City during the last ten or fifteen years, is that of concentrating the office buildings in a comparatively small section of the city. Nearly all the great office buildings of ten to thirteen stories in height are built on Broadway, below Chambers street, or in Park Row, Nassau street, and Wall street. Every time one of these enormous buildings is erected its offices are soon filled, and a permanent addition of several hundred persons to the daytime population of the lower part of the city is made. The result is seen in the terrible overcrowding every evening of all the ways of exit from the lower part af the city to the upper part, to Brooklyn and to New Jersey.

The great convenience of having the office buildings concentrated in one section of the city, and the evident tendency to erect such buildings south of Chambers street only, render it probable that the office section will always be confined to this portion of the city. The tall modern office buildings already erected cover only a small fraction of its area, so that there is ample room in it still for all such buildings that may be needed in the next century. The increase in their number will, however, vastly increase the daytime population and render a proper system of moving it to and from their homes an ever-increasing necessity. The problem is a far more difficult one now from a financial point of view, than if it had been attacked twenty years ago, before the present office buildings were erected, and before land had risen to its present enormous value. At that date it would have been a comparatively easy matter to do as Paris, Berlin and Vienna have done, cut one or more straight and wide boulevards directly through the city from North to south, on which could have been built four-track elevated railroads, two of the tracks being used for express trains and two for accommodations. Even to-day this is probably the best solution of the problem and the easiest from an engineering standpoint, but the enormous cost of the right of way will probably make it financially impracticable. At the Paris exhibition last year there were shown several plans for proposed rapid transit systems for Paris. One of the best of these was the *Systeme* Haag, which consisted in cutting wide boulevards nearly parallel to the present ones and erecting thereon an elevated structure, which from the views shown at the exhibition was a work of beauty as well as of utility. The French genius for beauty in architectural and engineering design was splendidly illustrated in these plans and they should be well studied by engineers who may have the planning of new elevated roads for New York.

As the problem now stands it is an extremely difficult one, and suggested plans for its solution run all the way from an enormous tunnel 150 feet under ground to cable roads on the surface and single track elevated roads in Nassau and William streets, connecting in some way not yet

MINE OWNERS AND ENGINEERS OF JOPLIN.

defined with either an elevated or depressed railroad running on the line of Elm street, which is to be widened for the purpose.

Heretofore the problem has been attacked not by the engineers but by the politicians, and it has made as yet very slight progress toward solution. The present elevated railroads were built long after the necessity for them existed, and while they were built of sufficient capacity for the city at that time it only took about ten years for the city to outgrow that capacity. So the Brooklyn Bridge was not built until long after the ferries were overcrowded, and in a very few years it became so crowded that another bridge is more needed now than it was when its building was begun. In all such cases the remedy for overcrowding has been applied altogether with reference to the needs of the immediate present and the near future, and without reference to the possible growth of the city in years to come. At the present time the chief difficulty is one rather of politics than of engineering. If the city government would only reach a conclusion that something must be done at once to give the city real rapid transit, and prepare the necessary financial scheme for raising enough money to secure it, a commission of engineers could then consider all the plans for perfecting it, and make a selection between them which could be carried into effect.

It is not possible, without a careful study of surveys, real estate values, cost of actual structures and various minor details of engineering plans which may be proposed, to form a proper conclusion as to what is the best plan for the future city, and we shall make no attempt to make such a choice out of the imperfectly developed schemes which have already been proposed. It seems to the writer, however, that the best solution is a four-track elevated railroad or viaduct, which has its southern terminus in a large station on the north side of Chambers street. The viaduct should be built so solidly that the highest train speed may be permitted. Two of the tracks to be reserved for express trains and the other two for accommodation trains. Trains should be run directly from Chambers street to all suburbs north, east and west within a radius of 20 miles of the City Hall without change of cars. Those trains going to Newark, Passaic, Paterson, Hackensack, Englewood and other towns in New Jersey would leave the main viaduct on a branch to be built somewhere about Tenth street, and cross the Hudson River on the bridge which is projected by Mr. Lindenthal, to be built from Stevens Point, Hoboken, to some point near Fourteenth street in this city. Those going to Brooklyn and Long Island towns would go on similar eastern branches built across the East River, one at Grand street and the other crossing Blackwell's Island. The main line should go across the Harlem River to a point 20 miles north of the City Hall. Branches should be run from points in the last eight miles of this main line to various points in Westchester County.

Certainly a plan no less comprehensive than the above will be needed by New York City within the next 20 years. New York City must have accommodations for suburban residents at least equal to those possessed by Philadelphia, London and Glasgow. In Philadelphia a passenger can go from the Broad street station to any suburban point north, west or south without change. In London, Charing Cross, Waterloo Bridge, and Cannon street Stations are in the heart of the city, and from them one can go rapidly to any point south of the Thames. In Glasgow the terminal stations of the three great railroads of Great Britain are in the business section of the city, no two of them being over half a mile apart. These three cities also have elevated viaduct systems, the only serious objection to which is their first cost, but now that money can be obtained by the city for less than three per cent. interest, and that the city already has a tax roll of over $30,000,000 per year, surely any amount of money required for the building of such a system could be secured.

One objection which may be raised to the proposed scheme is the great extent of room that would be required by the terminal station at Chambers street, but this could be greatly minimized by the adoption of the circulating terminal system which was proposed by Mr. Arthur M. Wellington for the Brooklyn Bridge. It would probably be advisable to use either electricity or cable instead of locomotives for at least two or three miles from the terminal station, to save the room they occupy and to avoid the noise, smoke and confusion they occasion in a station.

South of Chambers street local rapid transit should be provided in shape of either underground or overhead railroads run by electricity, to convey passengers to and from the station to various points between it and the Battery. Similar local roads should also be provided at various points across town.

Next in importance to the question of rapid transit, is the one of providing an adequate subway for the reception of the various electric wires needed for telegraph, telephone, light and power, and the pipes for water, steam, gas, and pneumatic and hydraulic transmission if these should at some later date be adopted in the city. The present condition of things under our street pavement is becoming intolerable, and is bound to get worse as the number of pipes and wires increase, and as the steam pipes now in the ground rust out and require replacement. It is a grave question whether all these kinds of wires and pipes can be allowed in one subway, but there should be no serious objection to this if the subway were made large enough so that a horse and cart could be driven through it, and if it be thoroughly ventilated. It is not improbable that in a short time the system of distributing steam by carrying it under the streets will be abandoned as a financial failure, and if so this will solve one of the difficulties connected with the subway.

In the present state of engineering progress we are not yet ready to dispense with steam as a means of heating buildings. Heating by hot water has proved a failure in Boston, and no satisfactory scheme for heating by electricity has yet been proposed. We can use electricity or compressed air as in Paris for power to run elevators and drive machinery, and hydraulic power, as in London, can also be used to a large extent for the same purposes, especially for elevators, but for heat nothing is yet as good as steam. We will not return to the use of coal stoves and open grates for heating, but it is likely that we will come to the system of carrying steam over limited areas such as that of a single block, the steam boilers, which must be of safety type, being placed in the center of the block in the rear of the buildings, and steam carried radially to every building in the block.

(TO BE CONTINUED.)

COFFER DAMS AND FLOATING CAISSONS.*

By Randell Hunt, C. E.

(*Concluded from page 79.*)

An ordinary caisson with sides of plank well caulked, but withouta bottom, sunk at a foundation site and surrounded with sheet-piling rest ng against it, makes one of the most serviceable and economical coffer dams, particularly when the dam rests on rock and the toe of the sheet-piling is protected by clay, preventing leaking under it. The principle of such a dam reduces the area of possible leaking to the space below the edge of the caisson, and the sheet piles have only to prevent leakage there.

A very notable coffer dam of this description is that of the viaduct of Aulne, in France, of which Mr. Arnoux was the engineer. Two of the three piers in the river offered great difficulties in regard to the foundation. A dam below the bridge site made the depth of water about 18 feet, besides which the high-water of the sea made it about 5 feet higher. The foundation was a schistous rock, with very much inclined beds, of which it was necessary to break off the surface in order to reach the hard rock, which was covered with mud and gravel. A perfect foundation required the piers to be built inside of a dry coffer dam. For this end, after having dredged off the soft material, a wooden bottomless caisson was submerged at each pier, 75 feet long by 33 feet wide, the sides having been well caulked in advance. As the inequalities of the rock made it impossible to fit the bottom of the caisson to it with any regularity after it was sunk, vertical sheet piles well jointed were driven down between the two last courses of longitudinal braces of the caisson.

A small dam of clay was placed against the feet of these sheet piles, and covered with strong canvas held in place by rock. The caisson was then drained, and a single pump working only two or three hours a day was able to keep it perfectly dry. The soft parts of the schist were easily taken off, the hard parts laid bare in regular surfaces, and finally the masonry constructed up to high water.

In setting the caisson in place, the dam below the bridge was made use of. The caisson, made on boats, was taken to the desired place and allowed to descend until it rested on posts placed under its edge, by escape of the water of the dam. Then, when the water rose, the boats previously released from the caisson were made fast to it again near the top, and raising it permitted the posts under it to be removed. The water, once more made to fall, let the caisson descend until it rested in the desired position. Thus a mass weighing more than 75,000 kilogrammes was easily handled.

At the bridge across the Ohio River at Louisville, the foundations were put in without any definite plan. The same method was not used at any two piers. At pier No. 5 a coffer dam similar in principle to that used at Aulne was employed.

A bottomless caisson was floated and settled into position. Sheet-piling was driven to the rock on the outside of this box, and further protected by puddling placed against the sheet-piles.

The lower four feet of the bottomless caisson was composed of 12 × 12 inch timbers, placed one on top of the other and joined together by vertical bolts, while the top six feet were made of 10 × 10 inch timber, the outside being flush. Eighteen inches of gravel and three feet of slate were excavated at this foundation. The coffer dam was very satisfactory after the puddling had been placed around it, but this was found to be requisite before the dam could be properly drained.

The fault of treating the designing of any engineering work as an abstract problem and of deciding on a plan according to scientifically correct rules, irrespective of the means by which it must be executed, is particularly mischievous in foundation work. The cost of the substructure of any extensive construction is, in the first place, a large proportion of the whole, and beside the financial question, the facility and quickness of construction are of vast importance.

The principle of constructing a heavy structure upon a floating base, which, simply by the action of gravity, gradually sinks until the desired foundation is reached, was in the earlier practice confined almost entirely to open caissons made with a bottom of heavy timber and sides of plank like a scow, which was sunk by building the pier within it until the weight was sufficient to sink it upon piles or the natural foundation. On the introduction of compressed air the caisson was modified so that below the first constructed base was introduced a chamber in which workmen could excavate while the floating structure above lowered itself. In devices of this method of huge cylinders of iron, or large cribs of timber and concrete, many of the greatest structures of modern times have been founded.

Excavating in compressed air, particularly at considerable depths, is, however, very expensive work.

The invention of the Milroy excavator and its subsequent improvements dispensed in many cases with compressed air. It is simply a small apparatus, which, as improved by Messrs. Anderson & Barr, consists of a dredging bucket made of four arms which, opened out, are four pointed spades, and closed together form a semi-circular receptacle. The weight of the dredge presses the points into the material to be excavated, while the action of raising the dredge first pulls the four arms deeper while at the same time closing them. The great usefulness of these dredges rests in their portability, simply suspending them on a stout chain swung from a derrick being all that is necessary.

In alluvial soils, sand, or even in clay of considerable stiffness, caissons formed either of great cribs, such as those of the Poughkeepsie Bridge, or of great iron cylinders like those of the foundations of the Hawkesbury Bridge in Australia, may be sunk to depths hitherto unthought of, by dredging out the material beneath them with Milroy excavators. The descent of the caissons is uniform, and the work of constructing the piers on top goes forward simultaneously with the settling of the foundation to its desired level of rock or other hard material.

In founding ordinary structures such as bridge-piers in shallow depths, to be placed upon piles, the cheap open box caisson affords a very efficient and economical method, and is, where practical, almost always preferable to a coffer dam about the foundation site, even if the head of water is but a few feet.

The mathematically as well as constructively extremely simple device

* Abstract of a paper in Transactions of the Technical Society of the Pacific Coa

of the open floating caisson has proved remarkably efficient for structures of considerable size and in depths of water of twenty feet or more.

The sides should be made of timber of sufficient strength to withstand the pressure of the water, and care bestowed on the proper dimensions of the caisson, so that during its sinking it will not be in danger of overturning.

If a vertical line drawn through the center of gravity of the water displaced by the floating caisson intersects the vertical axis of equilibrium *above* the center of gravity of the caisson and its load, it will be in stable equilibrium. If the point of intersection the metacenter of a floating body, falls below the center of gravity of the caisson and its load, this will upset.

Lack of precaution in checking this simple calculation has led to several accidents in sinking caissons, as for instance at Portland, Ore.

The sea wall now being constructed at San Francisco, at the foot of Market street, consists of a concrete wall 18 feet high, 12 feet wide at the base, and 6 feet on top. It is founded on piles and backed by a relieving platform founded also on piles, to which the wall is anchored at intervals of 10 feet. (See Figure 7.)

The harbor mud was dredged out to a depth of about 15 feet below the base of the wall, and the trench filled with sand before the foundation piles were driven.

The specifications required that after all the piles were driven a subsection of the work should be coffer-dammed, the water pumped out, the

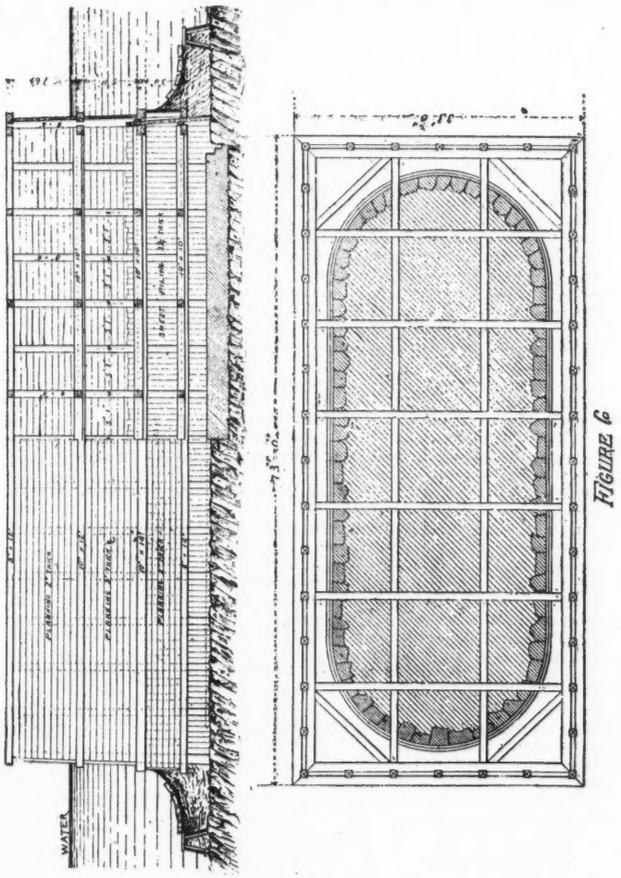


FIGURE 6

piles cut off and capped, and the wall built as shown in the plan, all concrete being kept free from contact with salt water for seven days.

A coffer dam constructed to enclose the first 75 feet of the wall failed to keep out the water.

The author, consulted at this stage of the work, advised the abandonment of the coffer-dam method, and substituting that of open floating caissons. The Harbor Commissioners sanctioned the change, on the contractors allowing a rebate to the State of some $5,000, and the work is now successfully going forward. The caissons being used in the work are shown in Fig. 8. The total length of the wall to be constructed is 450 feet. The number of caissons used is seven, six of 70 feet and one of 34 feet. The depth of water is from 10 feet at low water stage to 17 feet at high water.

The caisson is made of a bottom of two courses of timber, one of 12 inches thickness and the other of eight inches, laid at right angles to one another, and bolted firmly to each other with three-quarter inch drift-bolts. The bottom course 12-inch timbers are also bolted to one another, with seven-eighth inch drift-bolts, long enough to pass through three pieces.

The sides of the caisson are made of four and three-inch planks well spiked to the uprights or studding pieces, which are placed two feet between centers for a height of nine feet, and four feet between centers for the remaining top seven feet. These sides were fastened to the bottom by means of one-inch iron rods, made with a loop at the lower end and connecting with iron hooks which project through the bottom. These hooks are made of $1\frac{1}{8}$ round iron, with a nut and heavy washer on their lower ends, which are let into the timbers so as to be flush with the bottom. Partly let into the edge of the bottom plank, all around the

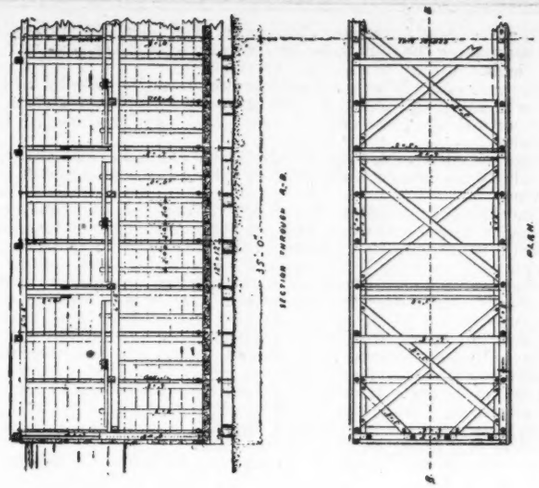


FIG. 8.

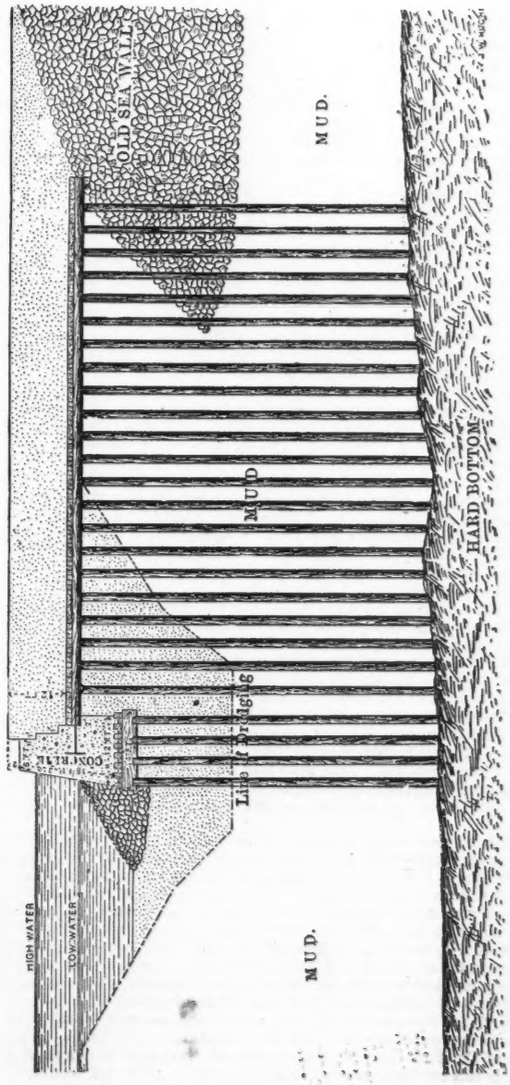


FIG. 7.

sides and ends of the caisson, is a piece of rubber one inch square, this rubber making the joint between the bottom of the caisson and its sides and ends.

The ends of the caisson can be separated from the sides by withdrawing a few bolts which connect the two end posts. A rubber strip is used on the vertical seam between the ends and sides, as shown in the detail drawing.

Excepting the joints between the bottom and sides, and at the corners, all other seams are carefully caulked with oakum throughout the entire caisson.

The sides of this caisson were designed to be used over and over again throughout the entire work, hence the apparent excess of material.

As the bottom of a new caisson is built and floated into position, the rods which hold the sides in place on the previously sunk caisson are unhooked, and the entire sides and ends are lifted up by heavy blocks and tackle and swung over the new bottom. As the tide rises the bottom is carefully guided into its proper position until it joins itself to the sides; the rods are quickly looped over the hooks previously placed in exact position in the new bottom, and screwed tight. The screwing up of the rods, tightening the sides against the rubber strip, makes a close joint.

The moving of the sides of one caisson on to the bottom of another is an interesting part of the work. They weigh about 30 tons, and to keep them from getting out of shape or distorted, so that each bottom will accurately fit in place, requires extreme care.

The sides of the seventy foot caissons which have now been used in sinking four different caissons, show practically no leaking.

The caissons have proved perfectly satisfactory, and no serious mishaps have occurred.

The connections between two sections of the wall, when sunk in place, are made by placing a coffer dam on top of the timber bottoms, which are made to press tightly together against a strip of rubber between them, by guiding the sinking of one caisson so that it presses against the previously sunk bottom. The sides of these coffer dams rest against another piece of rubber, which is let into the edge of a timber imbedded in the concrete near the ends of each piece of wall.

A dovetail is left in the concrete wall at the ends, about two feet square; so that when two sections are joined together there will be no joint between them, and the wall is continuous from end to end.

The grillage is drift bolted to the piles of the foundation, by first locating their exact position upon the bottom of the caisson, and partly driving the bolts at these points. Pieces of gas-pipe are then placed over the bolts and the concrete deposited around them, until the caisson comes to a firm bearing upon the piles; then a steel rod is let down each piece of gas-pipe and the drift bolt is driven home into the pile. These pipes are then pulled out of the concrete and used again in the next caisson.

PROGRESS OF THE CHANCE SULPHUR RECOVERY PROCESS.

The report of the Chief Inspector of Alkali and Chemical Works, generally in England, gives the following account of the industry for the year 1889:

In the number of works using the Leblanc process there is a further diminution in spite of the aid which the Chance-Claus sulphur recovery process is affording, though possibly in some of the works it came too late to be of service. There are no less than 12 installations of the Chance process now at work, and as many more are in the hands of the builders. The amount of sulphur now being recovered is about 400 tons per month, and this amount will shortly become about 1,000 tons weekly, or some 45,000 tons per annum. By this amount, therefore, will the output from the Sicilian sulphur mines be probably reduced. The total quantity exported from Sicily annually is about 360,000 tons, of which England takes 37,000 tons and America half of the remainder.

As in the Chance process, the sulphur is recovered in the form of sulphuretted hydrogen; the volumes of gas to be manipulated are enormous. Thus, in one works alone some four million cubic feet of sulphuretted hydrogen are being produced weekly, and it is estimated that when the amount of sulphur recovered reaches 60,000 tons per annum: the quantity of sulpheretted hydrogen to be dealt with will touch 1,508 million cubic feet annually. Great difficulty is experienced in removing the last traces of the gas, much of it after passing through the Claus kiln existing and escaping as sulphurous acid gas. To produce as little of this latter gas as possible it has been found to be advantageous to keep the former in slight excess over the air admitted for the partial combustion of the gas and to keep the temperature of the kiln low.

In the different works much more efficient apparatus and appliances are being introduced. Thus, in the manufacture of mineral phoshate the mixing is conducted in a closed vessel provided with a stirrer driven from the outside, and the mixture is then sent into a closed chamber or "den" where it remains until the discharge of acid vapor has ceased, the gases evolved being passed through wash towers. After such washing there should not be more residual acid gas than is equivalent to 0·2 grains of sulphuric anhydride (SO_3) per cubic foot. In the case of fetid gases the use of a cremator or combustion chamber for their decomposition has been recommended. This plan has been adopted by the Manchester Corporation for destroying the noxious gases given off in the boiling down of the liquid obtained by them in their pail system of removing house sewage.

With regard to the question of the evolution of black smoke, a committee has been formed in Manchester for the purpose of testing smoke appliances. It will pay attention to such points among others as (1) practical freedom from smoke; (2) reasonable amount of duty; (3) economy of fuel, etc. Experiments on and tests of the various appliances submitted to it will also be made. In this connection may be mentioned the method of producing gas used by Messrs. Brunner, Mond & Co. The distillation is conducted at such a low temperature that the ammonia is not destroyed, while a smokeless gas is produced from the coal. Per ton of coal about 66 pounds of sulphate are yielded. A description is given of the usual method for boiling down brine, and of the damage which is done by the evolution of acid vapors to the surrounding vegetation. A new method, that of Dr. Pick, for the evaporation of the brine by triple or multiple effect, is referred to, which process was illustrated and described in the ENGINEERING AND MINING JOURNAL of July 12th.

To this report is added the separate reports of each inspector, from which a few extracts are taken.

In district No. 1 there were 49 works under inspection in which were carried on 65 different processes, the amounts of material treated being as follows, the quantities being expressed in tons of 2,240 pounds: Salt decomposed, 6,728; bleaching powder made, 2,565; pyrites burned, 24,928; mineral phosphates and bones dissolved, 33,379; sulphate of ammonia made, 2,511; salt produced, 10,600. cement produced, 7,488.

In district No. 2 attention is called to the fact that both the sludge from the carbonators in the Chance process and the exit gases from the Claus kiln promise to be sources of annoyance, and complaints have been made on both these points. In the Widnes sub-district the inspector reports that from the former source no nuisance has occurred.

It is stated that in one works where sulphate of ammonia was being made the escape of hydrocyanic acid from the decomposition of cyanides present in the gas-liquor was so great that on two occasions it was found to be necessary to stop work; 382 tons of sulphate were obtained from the ammoniacal liquor of the patent coke ovens.

Most firms are now adopting the Chance sulphur recovery process. The amount of waste being treated in the St. Helens district is about 1,400 tons weekly. The total quantity of pyrites burned in the district (excluding Widnes and Runcorn) amounts to 90,365 tons. No brimstone is burned. Total sulphate of ammonia equals 4,160 tons. The amount of white salt produced is 1,154,649 tons. Very full tables of the various acid escapes are inserted.

A cement works has been started for the utilization of the lime mud from the caustic soda and Chance sulphur recovery process. The following return is of interest:

	Tons.
Pyrites burned for sulphuric acid or salt cake	132,426
Salt made into salt cake	209,587
Salt used in wet copper extraction	18,720
Bleaching powder made (including chlorate of potash)	64,927

It has been found that, although the average of the various exit escapes is satisfactory, yet that there have been many cases of excessive escapes of usually short duration. In this district the Chance process is making rapid progress, some £150,000 having been spent on it during the past 18 months, and ten works are either erecting or now possess the necessary plant. Here, again, the main source of annoyance is not from the Chance process, but from the exit gases from the Claus kiln; these containing from 8 to 15 grains of sulphur per cubic foot of the waste gases, the loss being thus considerable. To minimise this loss the temperature of the kiln should, as already stated, be kept as low as possible. The gases after leaving the *dry* flowers chamber should be passed through a *wet* scrubber to remove SO_2 and finely divided sulphur, and thence through vessels containing milk of alkali waste to absorb the SH_2, this solution then passing to the carbonators in the usual way. There are 10 Claus kilns 25 feet in diameter in the district, and 18 or 20 more designed, and each capable of producing 15 to 20 tons of sulphur per week.

Still less brimstone than last year is used for acid making. The total amount of ammonia in in its various salts manufactured during the year 1889 was 22,483 tons.

Of this amount 89 per cent. is made by the continuous process, and 11 per cent. by the intermittent.

In the Chance process it is recommended that large kilns of 30 feet in diameter should be employed, threby securing a lower temperature of decomposition and a better yield of sulphur. In the manufacture of sulphate of ammonia most of the sulphuretted hydrogen evolved is treated by the open oxide of iron purifiers. In one works per ton of sulphate of ammonia produced 100 pounds of sulphur have been obtained; each ton of coal yielded 27 pounds of sulphate; thus, for every ton of coal carbonised, about 1¼ pounds of sulphur have been recovered in the Claus kiln.

A new process for the manufacture of ammonium sulphate is that of Mr. E. Bowen's. The ammonia evolved is passed into the waste pickle from tin works. Oxide of iron is precipitated, which may be used in the manufacture of Venetian red, and the filtrate on concentration deposits crystals of the sulphate.

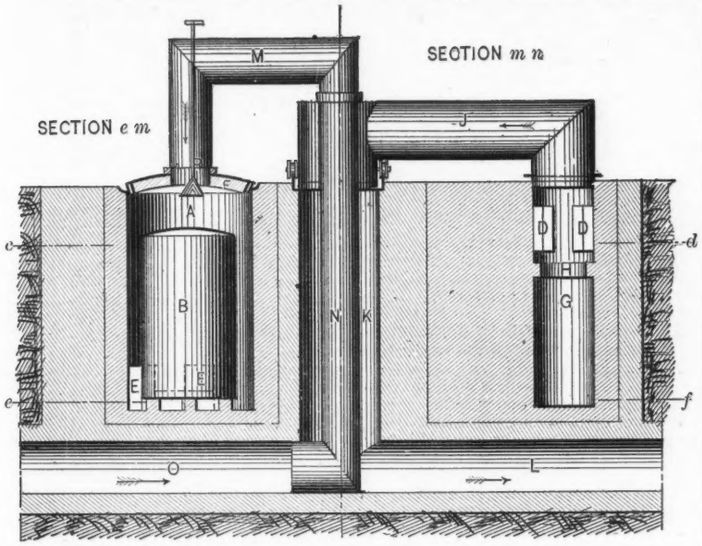
In Scotland, while the production of salt and of bleaching powder has diminished, the consumption of pyrites has increased 10 per cent., the acidity of the exit gases from the sulphuric acid works was 1·67 grains SO_3 per cubic foot, or considerably less than one-half of the limit under the act, while in the alkali works the average escape was 1·46 grains SO_3. The average escape of HCl per cubic foot of the chimney gases was 0·088 grains, a figure identical with that obtained for last year. From the manure works the escape was equal to 0·25 grains SO_3 per cubic foot. The manufacture of sulphate of ammonia has increased by about six per cent., the sources whence the ammonia is derived being noteworthy when compared with the corresponding sources in England. In this report also the Chief Inspector insists upon the importance of devising means for the prevention of the production of black smoke, a source of annoyance over which the inspectors have no power. On examination as to the grounds of complaint of destruction of vegetation, it was found that in most cases the cause rested with the volumes of thick black smoke and not from noxious acid vapors obtained in the smoke.

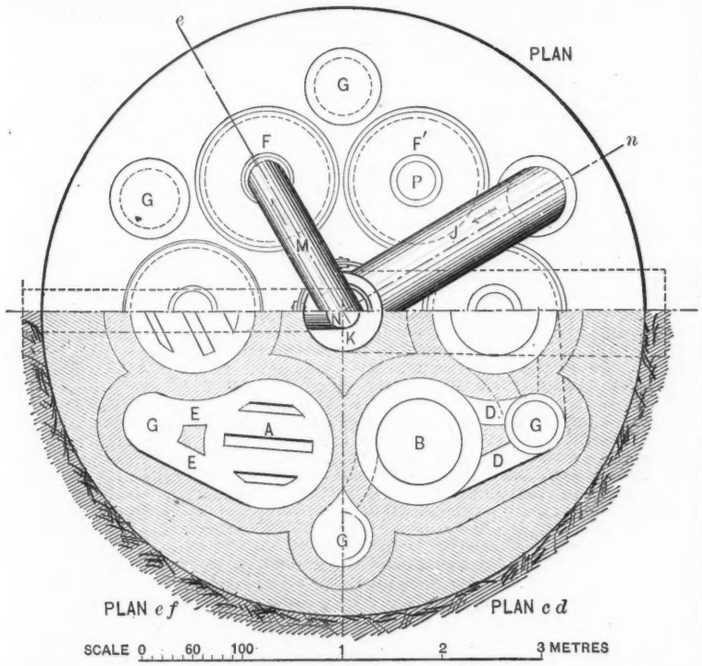
To Attack Mount Kenia, Africa.—Dr. Hans Meyer, the mountain explorer, and the only one as yet to reach the tops of the two summits of Kilima-Njaro, though 45 Europeans had visited the mountains before him, is preparing to visit Africa for the fifth time. His destination now is Mount Kenia, the second highest mountain in Africa which rises out of the plain north of Mount Kilima-Njaro, almost under the equator. Kenia has never yet been surmounted, though Joseph Thomson and Count Teleki have both been far up its comparatively gentle slope. The enormous mass is about 19,000 feet high, only 700 feet lower than Kibo, the higher summit of Kilima-Njaro. Kenia, however, is considerably less imposing in appearance than its southern rival, because though its top is perpetually snow crowned, it rises from a lofty plain that is upward of 6,500 feet high, while the plain at the foot of Kilima-Njaro is less than 3,000 feet high. Consequently Kenia does not appear to the observer to be nearly sa high as Kilima-Njaro. Dr. Meyer expects to spend next winter in the Kenia region, and, if it is within his power, he will add Kenia to his other great conquest.

HOFFMANN'S KILN ADAPTED TO ANNEALING WIRE.

We illustrate to-day Bourry's application of the principle of the Hoffmann kiln to the annealing of wire. In the arrangement shown six annealing pots are under treatment at once, but the idea could readily be applied to any other number.

We have six vertical cylindrical chambers, *A A*, arranged concentrically, in each of which an annealing pot *B* is placed. A series of six vertical flues *C C* is arranged concentrically with the six annealing chambers. Each of these flues connects one chamber with its neighbor by means of the horizontal flues *D D* and *E E*. In the center is a double flue, its central part serving to admit gas from the flue *O*, which leads from a gas-producer to the system, and its annular outer part leading to the flue *L* and thus to the chimney. From the inner or gas-flue the gas is led to one of the six annealing chambers by the movable pipe *M*, while





by a like pipe *J* the products of combustion are led from another of the annealing chambers to the annular downtake *K* and thus to the chimney.

The operation of the furnace is as follows: The hand-hole *P* in one of the covers *F'* is opened, allowing air to be drawn in by the chimney-draft. The gas meanwhile has been admitted to the chamber next to the left by the pipe *M*. The air thus draws down through one of the annealing chambers, and it is the one which contains the oldest annealing pot, *i. e.*, the pot which has been in the furnace the longest, and therefore contains the thoroughly annealed wire. From this oldest pot the entering air absorbs its heat, at once hastening the cooling of the pot and returning its heat to the rest of the system. Passing to the left, *i. e.*, in the direction opposite to that of the hands of a watch, the air now ascends through the adjoining flue *C*, and thence enters the second chamber, which contains the youngest of the six pots, *i. e.*, that with a new lot of cold unannealed wire. Here gas and air burn, and their products sweep along to the left, past older and older pots, till after passing the sixth of the chambers, which contains the oldest pot but one, they pass by the pipe *J* to waste, their heat having been soaked up by one pot after another. After a given interval the oldest pot is replaced by a new one, and then the pipes *M* and *J* are each moved to the next adjoining chamber on the right, and the operation goes on as before.

M. Bourry has favored a correspondent with the following details. One of his six-pot furnaces anneals four tons of wire per day, with a consumption of 10 pounds of coal per 100 of iron wire, or of 15 pounds of coal per 100 of steel wire. The wire is in the furnace altogether about 20 hours. One man per shift takes care of the whole apparatus. The pots have false bottoms for the readier removal of the wire.

We are credibly informed by an eminent French authority that those who have adopted the plan are well pleased with it. M. Bourry's address is 80 Rue Taitbout, Paris.

COST OF THE LOCUST MOUNTAIN TUNNEL, ASHLAND PA.

On July 1st, the workmen employed in the north and south ends of the Locust Mountain Tunnel cut through the intervening rock, and the largest inside tunnel ever driven in this section of the State is virtually completed.

The Locust Mountain Coal and Iron Company and Lewis A. Riley & Co. decided, in January, 1889, to unite and have an immense tunnel driven through the mountain for the purpose of draining the Centralia coal basin, and in this manner avoid the enormous expense of pumping out the water. They awarded the contract to Messrs. R. J. Malone & Co., tunnel contractors from New York, who broke their first ground on the north or Centralia end of the tunnel on April 15th, 1889. Seven days later they also commenced work at the south or Big Mine Run end of the tunnel.

A. C. Douglas, a member of the firm who has been in charge of the work, has used the Ingersoll-Sergeant rock drills which are driven by compressed air from an Ingersoll-Sergeant air compressor at each end of the tunnel, with three drills in each heading. The greater portion of the tunnel had to be driven through rock of a hard, fine, conglomerate nature. L. A. Riley & Co. had driven 171·9 feet of the tunnel to have it ready for the contractors, which left 4,993·3 feet for the latter to drive. In all this distance they struck no vein of coal thicker than three feet and the three leaders that were discovered were of an inferior quality. Many old and experienced miners had claimed that the Lykens Valley vein would be cut, but no trace of it appeared.

The north end of the tunnel was commenced in the Buck Mountain gangway of the old Hazel Dell colliery, and the progress was very slow for a while, owing to the heavy water which they had to contend with During September and October the men were compelled to stand in water three feet deep while working, and Mr. Douglas was compelled to secure larger pumps. In the south end, which was started at the base of the mountain about 50 feet from the Big Mine Run breaker, they did not strike water until last month. During the month of June the water was very heavy in both ends, and the men worked in it waist deep.

The entire distance driven is 5,165·2 feet, or almost one mile, and the tunnel is 7 feet high and 11 feet wide, with a ditch for carrying the water four feet wide and two feet deep. It will drain the inside workings of the Logan, Centralia and Hazel Dell collieries, which are operated by L. A. Riley & Co., of Centralia, and will also give the operators access to the Mammoth vein workings, which have been filled with water since the burning of the Prevost breaker in 1879. The Girard estate may also decide to drain their Continental colliery, operated by the Lehigh Valley Coal Company, and the North Ashland colliery, operated by the Philadelphia & Reading Coal and Iron Company through this tunnel.

Negotiations are now pending by which it is probable that R. J. Malone & Co. will be awarded the contract for driving another tunnel, which will connect with the one just completed. This will extend from the Buck Mountain vein to the Mammoth vein, a distance of 700 feet, in order to tap the immense body of water in the latter workings.

While driving the Locust Mountain tunnel the plant consumed 1,785 tons of coal on the south end and 1,600 tons on the north end. The expenses incurred were as follows:

Plant and repairs	$34,558 05
Powder and explosives	30,182.05
Oil, lights, etc	2,761.04
Labor	59,721.10
Total	$127,222.24

The number of feet driven in each end of the tunnel during the fourteen months required to complete the work can readily be learned by the following table:

1889.	South End.	North End.
April	60	61·23
May	281	186·5
June	216·78	184·7
July	193·8	127·9
August	169·6	238·9
September	166·3	111
October	168	207
November	148·1	168·6
December	193·8	117·7
1890.		
January	212·2	163·4
February	159 2	153
March	161·5	146·6
April	201	177
May	169	148
June	175	154

—*Miner's Journal, Pottsville.*

Deepening Greytown Harbor.—A despatch from Greytown, Nicaragua, dated July 10, says: "The steamer from New Orleans is anchored just in front of the company's shops. The dredge 'Herbert' also came over the bar this morning and is anchored near the 'Carazo.' The steamer 'T. L. Millard' is now doing splendid work, as there is already water enough for her to work over the bar. The spot where the 'Carazo' and the 'Herbert' are anchored is in the old bay of San Juan del Norte (Greytown), where vessels have not entered since 1866—twenty four years ago.

"The opening of the channel and the deepening of the harbor have been promoted by the action of natural forces set in operation by the construction of the pier and is an indication of the effect of its further extension and completion. It is, in fact, a restoration of the old harbor, concerning which so many doubts have been expressed. With the 'Herbert' inside the harbor more important results will soon be realized."

ROLLET'S PURIFIED CASTINGS.

At the spring meeting of the Iron and Steel Institute of Great Britain, in London, a paper by Mr. M. A. Rollet of Paris, was presented on the "Rollet process of producing purified castings"—and we are indebted to our contemporary, *Iron*, for the accompanying illustration. Pig-iron or castings, steel and iron, generally contain more or less sulphur, phosphorus, silicon, and other substances tending either to improve or to deteriorate their qualities. Sulphur and phosphorus are usually the only impurities that are taken into consideration in castings of steel or of iron. In refining so-called pure castings for iron or steel in the presence of an acid slag by any of the ordinary processes, products are obtained which contain the greater part of the sulphur and all the phosphorus contained in the castings treated. It even happens in the Siemens furnace that the refined (decarburized) product is more sulphurous than the bath at the commencement. When phosphoric castings are refined for iron or steel in the presence of a basic slag by one of the ordinary processes, the products obtained contain much less phosphorus than either the castings or the bath at the commencement. They retain, however, a notable portion of the sulphur. In either case, the steel or iron obtained is of mediocre or indifferent quality. It is, moreover, well known that steels obtained in the presence of an acid slag have special qualities, different from those of steels containing the same percentage of sulphur, phosphorus and other impurities obtained in the presence of a more or less ferruginous basic slag, and that crucible steel, which is obtained in the presence of the most acid and least ferruginous of all slags, possesses properties peculiarly its own. Therefore special steel, such as is employed in certain industries, *e.g.*, for the manufacture of ordnance, tools, etc., is preferably, or rather exclusively, made by melting on an acid bottom (or hearth), or in crucibles, such pure materials as are comprised in the same category as charcoal irons and the best brands of Swedish iron.

The process of final castings, as here described, is intended to be auxiliary to the manufacture of special qualities of steel, its object being to eliminate sulphur, phosphorus and silicon from the castings. It consists in melting castings or pig, or maintaining them at a very high temperature under a double action, slightly reducing and slightly oxidizing, in the presence of a slag obtained by admixtures of limestone or lime, iron ores and fluorspar, in proportions depending on the quality of the pig or castings employed. The apparatus employed for this purpose is a blast-furnace or modified cupola, using coke and hot blast. The burdens are introduced in the same way as in blast-furnaces and cupolas. It consists of a part *AB*, an independent shaft, *C*, several rows of tuyeres, *FFF*, a siphon arrangement, *SS*, for separating metal from slag, and a front chamber, *R*. Externally, it is composed of sheet iron and steel; internally, at the bottom it is lined with any suitable refractory material, preferably with magnesia. It is cooled externally at all parts liable to injury by currents of cold water. The tuyeres are arranged in several rows one above another. They are water tuyeres, and project into the furnace. The hearth is situated as near as possible to the lower row of tuyeres. A single hole, *lf*, serves for tapping both the metal and slag. In tapping. the metal is separated from the slag by means of the siphon *SS*, which is so arranged in relation to the hole *lf* as to prevent the blast from blowing through. The metal flows out at *fss* and the slag at *l*.

The tuyeres are arranged in several rows, to facilitate the melting of all the substances charged. They are arranged one above the other, so as to raise the temperature along a line passing in front of their nozzles, and so ensure good working. They project inwardly, so that their ends may not get clogged by the colder and more decarburized matters which descend along the walls. The approximation of the lower row of tuyeres to the hearth is intended to prolong the action of the blast upon the slag, which at that point is light and frothy, and upon the metal which flows down through it, so as to ensure a greater elimination of phosphorus. The separation of metal from slag, as soon as both are removed from the action of the blast, is carried out so as to prevent the phosphorus already eliminated from going back into the metal, a result which would be produced by the reduction of the phosphoric acid of the slag by the action of the coke and the metal. Another object of the separation is to prevent too great a recarburization of the metal. The temperature of the blast is as high as possible, viz., 400 degrees at least, so as to ensure the good action of the tuyeres. These would otherwise get clogged by the slag, which is always very refractory and stiff, or by the decarburized metal which forms at their ends.

The furnace being in operation, metallic iron is formed, by the action of the blast and the iron ore upon the cast iron or pig, on the bottom part of the walls, where it adheres, thus forming, after working twenty-four to thirty-six hours, a substitute for the original lining. The furnace may thus be run for an indefinite period of time. But it will be preferable, after two or three months' working to reline the upper portion, as the bricks will then be worn out by attrition. The production is from 50 to 75 tons per day of twenty-four hours. The product obtained usually has a white, spongy appearance. The slags are yellowish white. They contain almost all the phosphorus eliminated from the cast iron or pig in the state of phosphoric acid, and only a part of the sulphur in the condition of sulphide. The elimination of the sulphur is complete up to 99 per cent., and even more. That of the phosphorus amounts to 80 or 85 per cent., in exceptional cases to 90 per cent., and more. And as the recarburizing action of the coke sets a limit to the decarburization of the cast iron, a casting once treated may be treated again in the same manner; by which means, beginning with any sort of castings, a carburized iron purer than the best Swedish iron used for cementation can be obtained. The carburized iron thus obtained may be used in Siemens furnaces with acid bottoms, where it may be employed to a greater extent than cast iron or pig, and so diminish the weight, if wrought iron be required. It may be puddled, in order to produce iron destined for melting on acid bottoms, for crucible melting, or for cementation. It can also be used as cement steel for crucible melting, mixed with iron.

A Russian Scientific Expedition.—The Russian Government will dispatch a scientific expedition, under command of Colonel Lebedieff, to the districts of Mongolia bordering on Siberia. No doubt the probabilities of the Chinese Government's projected strategic railway in this direction will be duly examined and reported upon.

MATTE SMELTING FOR SILVER.—IV.

Written for the Engineering and Mining Journal by C. F. Torrance.

REVERBERATORY SMELTING AND SLAG CONSTITUTION.

In the reverberatory furnace the conditions under which the treatment of ores must be effected differ markedly from those of blast-furnace practice and from those of the roasting in Bruckner's cylinder. From the initial charge for the sulphurizing roast to the final running down or melting, appropriate modifications must be made in the various operations which have been described in former papers, in order to meet these differences.

The reverberatory furnace is simply an immense oven: upon the floor of which the charge is spread out for treatment. And upon this floor the ore must remain until its fusion is effected. Here, we cannot effect the rapid and perfect "mixing-in" of an added portion, as is so easily accomplished in the rotary roaster—and in this we are left at a great disadvantage. But here we have also an advantage in avoiding one source of trouble—from the reduction of iron, as, instead of the reducing gases of the blast-furnace, we can have a neutral, or an oxidizing, flame. In the blast-furnace the escaping gases are forcibly driven up between and among the fragments of ore, thus giving the best possible chance for reactions upon those fragments. In the reverberatory, the furnace gases, which are oxidizing rather than reducing—and may be nearly neutral—have access to the top surface only of the charge, and the general result should be a near approach to that of fusion in a crucible.

The reactions which are described in the paper on sulphuration roasting, the oxidation of iron with the simultaneous combination of its accompanying sulphur with some other metal, are precisely the reactions which occur in the ordinary reverberatory practice. And where the charge is properly made up of fine material, with sufficient of iron sulphide, etc., in homogeneous mixture, the complete sulphuration of all of the copper, lead and silver contents may be effected. It seems evident, however, that sulphuration can be effected only by direct chemical contact of the fused iron sulphide with the particles to be sulphurized, or, perhaps, in a small degree, indirectly, through the sulphur and oxygen carrying mediation of the slag. If, therefore, with an even mixture the iron sulphide be not present in large excess, it will, on fusion, run down toward the bottom of the charge before the sulphuration is completed, to a degree which will leave the top portion incompletely sulphurized. And so, on fusion of the whole charge, there will be loss in the slag from this top portion. If the iron sulphide be present in sufficient excess, complete sulphuration of the whole charge may then be effected; but a large portion of the sulphide will run down before the reactions are over, and so the small quantity of matte which is retained in the slag will be much richer than it should be. It is evident, also, that the coarser and the more poorly mixed the charge may be the greater will be the tendency to increase such losses. A large lump of sulphide would run down to the bottom, on fusion, with but little effect, save the after one of adulteration of the matte.

To avoid all these difficulties, so far as possible, I would make up the charge with only sufficient of iron sulphide to effect the desired reactions with certainty; adding a quantity of coal more nearly sufficient for the completion of the reactions, as described in my last paper, than will be permissible in roasting for the blast-furnace. All the necessary fluxes, with a little fluorspar or crushed slag to start the fritting, should be mixed with the initial charge, it being impracticable to stir, or mix in, effectively, any portions which may be added after. Where concentration of the matte is desirable, no coal should be used—except in making the most effective use of a minimum proportion of pyrite—as will be explained elsewhere. The proportion of sulphide should increase from the bottom of the charge to the top.

The charge, when properly made up, should be slowly heated until fritting begins; and the remaining sulphides, crushed matte or ore, in quantity sufficient to make up the matte product to the required amount, should then be added to the top of the charge, and should be mixed in with the upper part, so far as practicable, so as to break up the crust which is formed during the fritting, and so to prevent the formation of sink holes in the plastic material and the consequent running down of streams of melted metal. The whole charge may then be run down together. This method of procedure will permit the collecting and the washing out of the richer portions of matte by the poorer.

The pyrites, if used in this way, would count for next to nothing as a collecting medium, and a very large proportion of the matte product would have to be continually returned to the furnace. Where low grade mattes from other sources are available they may of course, be used for the filling and for the top charge. Where pyrite alone is to be used and the supply is scanty, two-thirds of the whole output of matte may be continually crushed and returned; mixing one part with the initial charge and using the other for the topping off after the roasting. It is to be understood, of course, that any increase in the matte product, from utilization of sulphur by any mode of smelting, must be at the expense of the iron oxides, and where pyrite is cheaper than iron ore no coal should be used.

These suggestions, so far, apply to the use of the mono-sulphide alone. Taking, now, our supposed case, in matte smelting for silver, where the sulphur content of the raw ore is to be utilized so far as possible, it is evident that, if the whole be mixed up at first, a great part of the sulphur which is liberated from the pyrites by the heat will be oxidized by the surplus oxygen of the iron oxide before the latter can be reduced by the coal which is to be added for that purpose. And were this to occur the coal would afterward reduce an additional quantity of iron to metal, which would, finally, leave the silver, etc., in the metallic state. The pre-heating of the oxidized mixture, with a subsequent addition of the pyrites, as described in my last paper, does not seem practicable here. It would be hardly possible to make a sufficiently thorough intermixing of the added portions, and the opening of the furnace door for that purpose would admit so much air that much sulphur would be oxidized and lost. The best that can be done seems to be to place the pyritous ore in that position where it will be the last portion to be heated—that is, near the bottom of the charge—and to use coal with caution in that locality. The extra portion of coal, for reduction of metal to combine with the sulphur, should be mixed with the top portion only of the initial charge, giving to the lower parts only a sufficient quantity to reduce the magnetic oxide

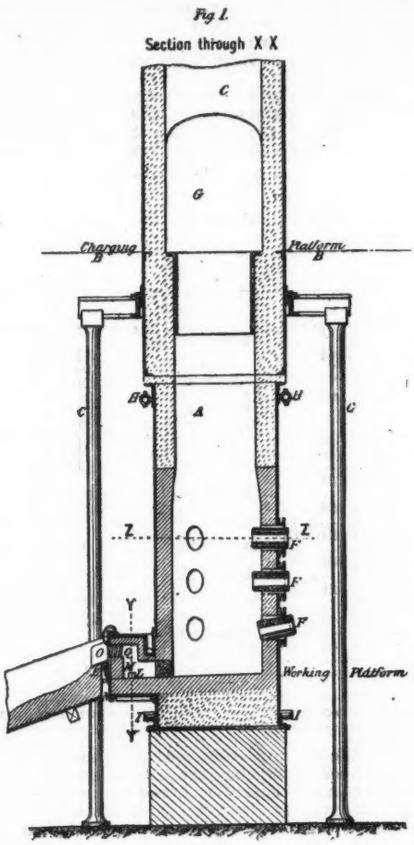
which is left by the sulphur, or about the equivalent of 2·6 per cent. in pure carbon of the estimated weight of such oxide.

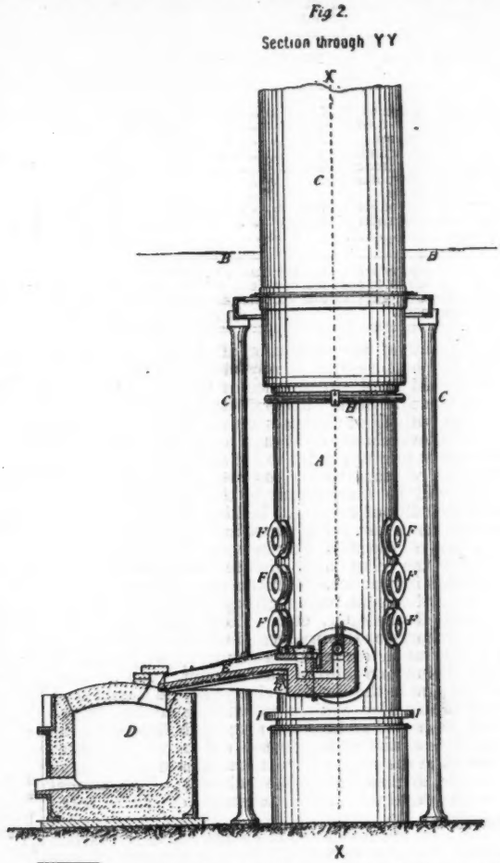
Where the supply of pyritous material is abundant the same may be crushed and mixed in with the initial charge, the coal being omitted or used with great caution. But this manner of procedure can only produce, practically, a quantity of possibly not more than two-thirds of the amount of the matte which may be obtained by the previous mode from the same quantity of pyrites. Theoretically, the quantity of matte would be but one-half as great, were the liberated sulphur all wasted, as it would be were it all saved; but, practically, anything like perfect realization of theoretical "ifs," except in matters of waste, cannot be expected.

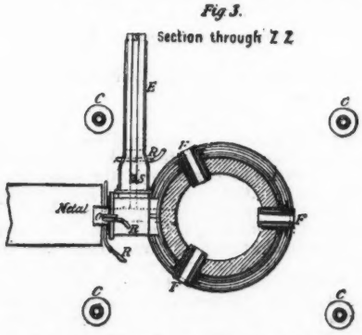
Where the pyritous material consists of complex ores, with a little pyrites scattered among the other minerals, then a mixed charge is the best that can be done. It is not easy to determine, without experiment, just how much coal can be used without precipitation of metallic iron from the slag. At least one-half of the surplus sulphur of the pyrite will be set free at a comparatively low temperature, and it seems certain that, in the mixed charges, a large part of this free sulphur must be wasted in the reduction of the sesqui-oxide of iron to the magnetic oxide. With pure magnetite for a flux, this difficulty might be avoided; but much of the sulphur would be lost as vapor, nevertheless. This portion of one-half of the surplus sulphur, as set free at first, will, for one part of pyrite, reduce four parts of the sesqui-oxide of iron to the magnetic oxide. And, as 1 to 4, is greater than the ratio of pyrite to iron oxide in extreme cases, it will be apparent that this first portion of sulphur may be entirely used up in such reduction, and that, for this first reduction, a further quantity of coal may be required. When the ratio of pyrite to sesqui-oxide, in the charge, is greater than 1 to 4, the sesqui-oxide will, probably, all be reduced to the magnetic oxide by the sulphur; and then the permissible proportion of coal may be only so much as will bring this oxide to fluxing condition, or the equivalent of 2·59 per cent., in pure carbon, of its weight. This much carbon will, I believe, be permissible in all possible cases, except where concentration of the matte is desirable; but the conditions of the operation seem so uncertain that I cannot attempt to say how much this percentage of carbon may be increased. And, as the proportions of the ingredients of the charge are varied to meet the various qualities of an available ore supply, the matter of correct carbon proportioning becomes still more complicated. Any portion of sulphur which remains to be liberated after the temperature has been increased to the degree at which the activity of the coal as a reducing agent begins will probably all combine with the iron which is reduced by the carbon; and, whatever the amount of the sulphide so produced, such product will require a proportionate quantity of coal for the reduction of its iron from the slag compound. Here, again, the appearance of metallic silver, lead or iron in the matte product will be the experimental indication of too much carbon. The carbon proportion may be increased until this result is reached, and may then be diminished gradually until the best results are obtained. This should be just when a marked reduction in the proportion of the matte product begins. It was my intention to have made a series of experiments upon these matters before concluding these papers, but illness prevented. I was especially desirous also of studying the effect of lime and baryta, but can only offer some deductions from general practice.

Lime, baryta and iron oxide, with all other non-reducible and non-volatile oxides, must be made to combine with silica to form a slag. The correct proportioning of the ingredients of a charge to form a slag of proper character is a matter of the first importance in all metallurgic ore-smelting operations. Theespecial requirements of our matte-smelting process are, that the slag shall be sufficiently fusible, and that it shal take up the least possible quantity of sulphur. A sulphurous slag is generally supposed to cause loss of silver and of lead; but this may not, necessarily, be true. The usual loss may be due, rather, to the ultra basic character of the "sulphurous slag," causing precipitation of metallic silver and lead, and the solution of the latter by the free alkali, which would take up the silver also, with the lead. Imperfect sulphuration of a basic slag would, I believe, cause such losses; but this may be a mistake.

The fusibility of a slag increases with a decrease of silica, and an increase of the bases, up to that point where the compound may be regarded as neutral in reaction, or most stable in composition; and the power o taking up sulphur increases from that point most rapidly with any fur ther decrease of silica or increase of base. The reduction of metallic iron from a basic slag is also very certain to occur wherever reducing influences exist, as in the blast furnace, while the reduction of metal from an acid one is a matter of much greater difficulty. So, it is evident that the best slag for our purpose will be just so far "acid" in character that the above difficulties will be prevented, so far as may be, without causing too great a degree of infusibility. The ortho-silicate slag is the most fusible one; but in the blast furnace it would loose metallic iron; and in the reverberatory, it would too rapidly corrode the acid lining of the furnace. The matte being acid, slightly, toward the ortho-silicate of lime, or of calcium, Ca_2SiO_4*, this acidity must







ROLLET'S APPARATUS FOR PURIFIED CASTINGS.

* Whatever the true nature of the silicate-compound when formed, whether the order of atomic aggregation in the molecular particle be primary or secondary, the matter that most interests us here, is the main fact, that we may form our silicate slag by the fusing together of a mixture of silica with definite proportions of the metallic oxides. We may, or we may not, regard the resultant slag as a compound still containing these compound ingredients of the original mixture.

also be offset by the presence of a more acid compound in the slag; or there will be a corresponding, continuous, slow reduction of metal—silver or lead, if present—from the matte. Such reduction would cease, only on presence of sufficient of metallic iron in solution, to render the matte as "basic" as the slag, and so to balance the "avidities" by a continual decomposition of the calcium sulphide as fast as it may be formed; conditions which cannot be fulfilled until all the silver and lead are precipitated.

The usual practice of metallurgists is to compare slags by their silica percentages; but such comparisons are of no value where the relative proportions and character of the basic constituents are much changed, a different proportion of silica being assignable to each unit of weight of each of the different bases, as shown in the accompanying table.

Manganese oxides may be reckoned as the same as the corresponding ones of iron, nearly. The black, or dioxide, however, has no iron analogue—it requires, for its reduction, nearly twice as much carbon as the sesqui-oxide, or just that, if the manganese be estimated as sesqui-oxide, as will be most convenient.

PERCENTAGE WEIGHTS OF INGREDIENTS, AS REQUIRED FOR FORMATION OF ORTHO-SILICATE COMPOUNDS FOR SLAGS.

100 of silica takes *of base.*		100 of base takes *of silica.*
266.42	Of sesqui-oxide of iron (+ 10 of carbon)	37.54 (+ 3.75 c.)
257.52	Of magnetic oxide (+ 6.65 of carbon)	38.83 (+ 2.59 c.)
186.48	Of calcium oxide (lime)	53.61
510.31	Of barium oxide (baryta)	19.59
133.18	Of magnesium oxide (magnesia)	75.08
156.91	Of potassium oxide (potassa)	63.72
120.09	Of sodium oxide (soda)	83.27
113.43	Of aluminum sesqui-oxide (alumina)	88.15
170.16	do. When potassa or soda is present*	58.77
270.56	Of zinc oxide	36.96

* Alumina combines only in company with another base, as lime, potassa, soda or iron. On analysis, iron silicate gives 29.43 per cent. of silica; calcium silicate, 34.90 per cent.; barium silicate, 13.01 per cent.; magnesium silicate, 42.89 per cent.; soda and alumina double silicate, 39.91 per cent.

Thus it will be apparent that the estimation of the amount of the fluxes, as necessary for the best results in any case, will be rather a crooked problem. We should check our practice by ultimate analysis of the slags as actually produced. Such analysis should always show enough of silica to combine with all of the bases in the proportion to each, as given in the table; and there should be always a further quantity of silica in excess of this amount to give acidity to the slag.

The amount of this excess of silica which may be permissible in the fluxing of siliceous ores, will be limited only by the permissible corresponding decrease in the fusibility of the slag. Making a lime-iron slag, the proportion of lime used being less than two-thirds of the weight of the iron oxides, the excess of the silica may be equal to one-half of the ortho-requirement—making the slag approximate $Ca_2Fe_2Si_3O_{10}$—and we can hardly go beyond this in practice. A better proportion will be an excess of silica = ⅓ of the ortho-requirement, giving compounds approximating $CaFe_2Si_3O_7$ and $Ca_2FeSi_3O_7$, etc. These latter are easily fusible, and, I believe, also represent the practical limits of the proportion of lime, which should not much exceed the amount, by weight, of the iron oxides, nor fall much below one-third of that amount. All of these proportions are for the mixture in the furnace-charge before the fluxing.

Aluminum may be in combination with potassium or sodium in the gangue rock, and in such cases will go into the slag as indicated in the table. Unfortunately, potassa and soda are too expensive for use as fluxes, except when present in the rock, and so, ultra-aluminous ores may require extra care in order to make a fusible acid-slag. The normal alumina, lime and iron compound will require no excess of silica, being acid itself.

Nothing has been said, so far, about the modifications in the carbon requirement, for reduction, which may be necessary on account of any oxygen-yielding compounds being present in the gangue; the oxides of iron and of manganese have been spoken of as fluxes, and, when present in the ore, are, of course, to be estimated; and the sulphate of baryta, and of lime, will require carbon for their reduction before they can enter the slag. How far this reduction must go, for these sulphates, and in what proportion they may be forced into the slag without combining with silica, I am, as yet, unable to tell.

In conclusion, let me say that these papers have not been offered with the belief that "matte smelting" for silver can replace the "lead process," under conditions which are favorable for the conduct of the latter. But, where the smelter must pay for the privilege of using the lead and must charge the premium up to the silver miner, it does seem to me that a practical system of utilizing the cheap and abundant sulphide of iron for the same purpose must prove a success, and especially a success where pyritous ores are to be treated, anyway, for their valuable ingredients. The poor mattes which are produced in this way may be concentrated and treated by any of the usual methods. They may, in fact, be regarded as "rich ores."

Equivalent weights of compounds which enter into combination in slags, with logarithms and logarithmic complements, the latter representing the logarithms of the number of equivalents of the compound in 1,000 units of weight:

Compounds.	Equiv. Wts.	Logs.	Log. Comps.	Percentages.
SiO_2	59·92	1·777,572	1·222,428	Si = 46·73
Al_2O_3	101·96	2·008,429	0·991,571	Al = 53·04
Fe_2O_3	159·64	2·203,143	0·796,857	Fe = 70·01
Fe_3O_4	231·46	2·364,475	0·635,525	Fe = 72·43
CaO	55·87	1·749,179	1·252,821	Ca = 71·43
MgO	39·90	1·600,973	1·399,027	Mg = 60·00
BaO	152·89	2·184,379	0·815,621	Ba = 89·54
K_2O	94·02	1·973,220	1·026,780	K = 83·02
NaO	71 66	1·857,091	1·142,909	Na = 77·82
ZnO	81·06	1·908,807	1·091,193	Zn = 80·31

DAYTON, Columbia County, Wash., July 18, 1890.

ACCURACY OF THE DRY ASSAY FOR SILVER.

A Görz (Berg-und Hüttenmännische Zeitung, 1888, 441), and H. Rössler agree that for the assay of argentiferous materials the use of the scorifier is preferable to that of the crucible (unless special circumstances have to be considered, such as the presence of carbonaceous matter or the fact of ore under treatment being a very poor one) as it gives results which are higher and nearer the truth.

In 100 grms. of crucible-slag, Görz found 2 and 4 mg. of silver in two different samples, and is of opinion that no sensible loss occurs in scorification, the chief amount of deficit being due to the subsequent cupellation. Nevertheless silver is present in scorifier slag, 100 grms. of it yielding 16·5 mg. of silver in the case of a rich ore, and 2·5 mg. in that of a poor one, corresponding to 0·25 and 1·04 per cent. respectively of the total silver present in the sample.

The loss of silver during cupellation is due both to absorption in the cupel and volatilization, and increases, as would be expected, with the proportion of lead, and the temperature used.

In used cupels were found: in 100 grms. that had been used in the assay of a rich ore, 45 mg. of silver, corresponding to 0·5 per cent. of the total silver, and in the same quantity used for a poorer ore, 2 mg., equivalent to 1·5 per cent. of the whole.

Further, 580 mg. of silver were found in 100 grms. of flue-dust of a gas-muffle.

The appended table shows the mean results of a large number of assays made on mixtures of known composition, and indicates what loss may be expected even when, as in this case, the utmost care is exercised, and the cupellation conducted at the lowest possible temperature.

Substance.	Quantity of silver present.	Silver taken.	Lead taken.	Proportion of lead.	Percentage of silver lost.
	g. k.		g.		
Argentiferous copper	150 in 100	15 mg. with 10 g. copper	200	12,000 : 1	8·3
" "	2,000 " 100	200 " 10 "	160	800 "	4·5
Argentiferous lead	150 " 100	150 mg.	100	600 "	2·5
" "	300 " 100	150 "	50	300 "	2·2
" "	700 " 100	150 "	20	120 "	2·0 *
Rich argentiferous lead	1,500 " 100	150 "	10	60 "	1·6
" " "	3,000 " 100	150 "	5	30 "	0·9
" " "	15,000 " 100	150 "	1	6 "	0·4
Lead ore	50 " 100	2·5 mg. in 5 g. 20 times	40	16,000 "	3·5
"	100 " 100	5 " 5 " 10 "	40	8,000 "	2·8
"	500 " 100	25 " 5 " 4 "	40	1,600 "	2·3
Silver ores, slags, silver sulphide, etc.	1,600 " 100	40 mg. in 2·5g.	40	1,000 "	2·3
Silver ores, slags, silver sulphide, etc.	4,000 " 100	100 " 2·5 "	40	400 "	1·9 †
Silver ores, slags, silver sulphide, etc.	10,000 " 100	250 " 2·5 "	40	160 "	1 6
Silver ores, slags, silver sulphide, etc.	20,000 " 100	500 " 2·5 "	40	80 "	1·3
Silver ores, slags, silver sulphide, etc.	60,000 " 100	1,500 " 2·5 "	40	27 "	0·8
Lead ore	50 " 100	12·5 " 25 "	25	2,000 "	5·3
"	100 " 100	25 " 25 "	25	1,000 "	4·0
"	500 " 100	125 " 25 "	25	200 "	3·1 ‡
Slag	700 " 100	175 " 25 "	25	150 "	3·5
"	2,000 " 100	500 " 25 "	25	50 "	2·7

* Cupelled. † Scorified and cupelled. ‡ Run down in a crucible and cupelled.

Even here the loss appears smaller than is really the case, for the buttons of silver obtained by cupellation are never quite pure, but always contain some tenths of a per cent. of lead, and frequently copper and bismuth as well. It suffices to dissolve a few grms. in nitric acid and supersaturate with ammonia (a white precipitate of lead and bismuth hydrates, and a blue color due to the copper being formed), in order to demonstrate this.—*Dingl. Polyt. Jour. Soc. Chem. Ind.*

LIQUATION OF GOLD AND PLATINUM ALLOYS.

By E. Matthey.

It is a well-known fact that when molten alloys of certain metals are cooled, some of the constituents separate and become concentrated either in the center or in the external portions of the solidified mass; to this segregation the name of liquation is given. It is especially noticeable in the case of silver-copper alloys, and its importance is now being widely recognized in almost all branches of metallurgy. The author has studied the behavior of alloys of gold and platinum. There are two methods of parting gold from silver, the one with nitric acid, the other with sulphuric acid. When platinum is present in the gold or silver, and the nitric acid process is employed, the platinum, when existing in small proportions is dissolved out with the silver, leaving the gold free; sulphuric acid does not extract the platinum. As it has been found that in an ingot obtained from this residue different parts of it do not possess the same composition, it is evident that the platinum has been re-distributed by liquation. Spheres of gold containing platinum were cast in iron molds. Parts were taken from different parts of the two hemispheres and assayed. Two alloys were treated in this way; one consisted of 880 of gold to 050 of platinum, and the other of 700 of gold to 120 of platinum. In the one case the maximum difference between the gold percentage is a variation of 032, viz., 887 on the outside against 883·8 at the center of the alloy; and in the platinum 047·5 on the outside against 052·5 at the center, an extreme variation of 005 is shown. In the other case the maximum difference between the gold percentage is a variation of 383, viz., 732·4 on the outside, against 694·1 at the center of the alloy, and in the platinum 122 on the outside against 166 at the center, an extreme variation of 044. The platinum, on cooling, therefore, liquates from the gold, and becomes concentrated toward the center of the alloy. The following table represents the assays of portions cut from one end of ingots of gold and platinum, and the actual amount of fine gold obtained. The results prove that

the percentage of gold in the outer portion of ingots of platinum-gold alloy does not represent the true percentage of gold in the alloy:

Weight in Troy ounces.	Platinum by assay.	Gold by assay.	Percentage of gold by the fine gold actually obtained.
728·5	·111	·825	·812
355·0	·120	·660	·630
589·5	·120	·800	·780
435·0	·045	·850	·845
480·5	·086	·842	·830
	·110	·830	·821

The results given were observed in platinum-gold alloyed with silver, with copper, and with both silver and copper; but, in order to prove whether or not such alloy had any tendency to carry the platinum to the center of the mass, 900 parts of fine gold were melted with 100 parts of pure platinum, and, after repeated meltings, cast in the same mold as previously used. The result was as before, the ratio of gold to platinum on the exterior being 900 to 098 against 845 and 146 at the center of the mass.—*Jour. Soc. Chem. Ind.*

Proposed Compression of Gases.—Mr. Gailletet, Member of the Institute, and author of important work on gases, proposes to build a manometric tube from foot to top of the Eiffel Tower, to fill it with mercury and successively in its lower end subject the various gases to the pressure of the quicksilver $\frac{300 \times 13{\cdot}59}{10{\cdot}33} = 394{\cdot}67$ atmospheres.

Chicago Pumping Works.—The Chicago city pumping works, in charge of Mr. T. E. Belton, Chief Engineer, located in the portion of the city known as Bridgeport, pumps 54,000 cubic feet of river water and sewage into the Illinois Canal every minute. Eight centrifugal pumps, with eight boilers, do the work, forcing 77,760,000 cubic feet, or 570,240,000 gallons of water, each 24 hours into the canal, thus creating a current in the river of about four miles per hour from the lake inland It is estimated that if the lake end of the Chicago River were closed it would be pumped dry at this rate in 36 hours; in other words, it is claimed that the water in the entire river is renewed by these works once each 36 hours.

There is probably more traffic done on this stream than on any other of its size in the world; but without these pumping works it would become nothing but a big sewer, carrying pestilence and death in its course. It is bad enough in that respect as it is.

The Water Safety Lamp.—The attention of the Home Office authorities having been drawn by her Majesty's inspectors of explosives to the fact that between 300 and 400 deaths and about 2,000 cases of serious injury occur annually through the use of imperfect and dangerous mineral oil lamps, they requested Prof. Boverton Redwood, F. I. C., in conjunction with Sir Frederick Abel, F. R. S., to advise them upon this subject. One of the lamps submitted to and reported upon by Prof. Redwood is the water safety lamp, in which a reservoir of water, the passage of which is open to the flame of the lighted wick, is made to extinguish the latter immediately the lamp is overturned. The water is contained in a casing or jacket placed directly over the oil chamber, and having an annular opening around the wick chamber. Upon the lamp being overturned the water immediately rushes out of the jacket and, passing through the perforated air passage to the wick or combustion chamber, immediately extinguishes the flame. This ingenious but simple device is the invention of Mr. Devoll, C. E., who has thus succeeded in superseding the various mechanical arrangements by which the automatic extinction of this class of lamps has hitherto been effected. The present invention embodies the requisite qualities of simplicity, certainty of action, and cheapness, and it is equally applicable to the ordinary cheap artisans' paraffin lamp and to those of the most costly kind. A demonstration was given with this lamp at the Savoy Hotel, when a number of lamps were instantly extinguished on being simply overturned or thrown against a wall or on the floor. A crucial test was the partial emptying of the water reservoir of a lamp, filling it up with paraffin, lighting the wick, and overturning the lamp, when the light was at once extinguished.—*London Times.*

A Novel Wrought Iron Chimney.—The following are particulars of a wrought iron factory chimney of a somewhat novel description which has been built at Creusot. The total height is 279 feet, the diameter 23 feet at the base and 7 feet 6 inches at the top, the total weight being 80 tons, exclusive of masonry foundations. The latter are carried 3 feet 3 inches above the ground and weigh about 300 tons. The shaft was built in successive rings, each 4 feet 1 inch high, the thickness varying from $\frac{9}{16}$ inch at the base to $\frac{1}{4}$ inch at the top. The nine lower rings were formed of eight plates each, the upper ones of four plates each. The base was encircled by a massive angle iron bolted to the foundation. The eight lower rings were lined with fire brick. The erection of the chimney occupied 70 days, including taking down the flying scaffold. The latter was of a somewhat novel character. It consisted of a central wrought iron tube, 7 inches in diameter, and was provided at the bottom with four wooden crossbars or arms, so clamped that their length could be adjusted to suit the varying diameter of the chimney, and carrying the internal platform. These arms rested on angle brackets refitted to the interior of the plates. The upper part of the central tube carried four cross-arms, or jibs, each consisting of a pair of timbers stiffened by raking struts from the central tube. From their outer ends was slung the exterior circular platform. The latter consisted of a pair of angle iron rings, to the outer part of which was riveted a plate iron fence, while the inner was provided with T-iron stanchions. Radial bearing timbers, resting on these rings, and adjustable endwise to suit the varying diameter of the chimney, carried the platform, an annular space being left just sufficient for hoisting the plates. The latter operation was effected by a rope passing over an adjustable pulley fixed to each jib in turn, and carried down a central tube to a snatch block fixed at the bottom of the chimney. As each successive ring was riveted up, two pairs of bars were laid across, by which the scaffold was slung by four jackscrews furnished with ratchet collars, and thus raised high enough to take a bearing on the next set of angle brackets. The complete scaffold weighed about four tons, and the heaviest plate about eight hundredweight. The total cost of the chimney, without foundation, was about $8,000.

On the Technical Value and Preparation of Magnesia.—Magnesia formerly chiefly valued on account of its medicinal properties, has recently risen into great commercial importance owing to its infusibility and its employment as a lining for converters used in the basic process of steel manufacture. Caron, whose process was in the first instance followed, used calcined magnesite. This was made up with one-sixth of its weight of tender-burned magnesia, and from 10 to 15 per cent. of water, into a plastic state; it was then compressed into bricks in iron moulds, and burned at a dull red heat. Ehrenworth has pointed out that, if the refractory properties of the magnesia are to be evoked to the full, it is of the utmost importance that the whole of the magnesia should be dead-burned; the process, moreover, being carried so far as not only to expel the whole of the carbonic acid, but also to cause the full amount of shrinkage which this material is capable of attaining. This extreme amount of calcination is very difficult to effect, owing to the tendency of the magnesite to fly into splinters, and to drop to pieces when subsequently touched, and in consequence of its being such a bad conductor of heat the stone is very hard to burn in large pieces.

Recently dolomite, which is a double carbonate of lime and magnesia, has been used instead of magnesite. In order to utilize this material there are two processes before the public, that of Closson and that of Scheibler. Under the former plan the calcined dolomite is mixed with chloride of magnesium, the chlorine in which separates from the magnesia and combines with the lime, yielding a soluble calcium chloride which can readily be washed out, leaving behind the insoluble magnesia. Under the process of Scheibler the calcined dolomite is treated with dissolved sugar leading to the formation of sugar of lime and leaving the magnesia. The solution of sugar of lime is then exposed to carbonic acid gas, which separates the lime as a carbonate, leaving the sugar ready for re-use. Both these systems of producing magnesia have the advantage of relative cheapness in their favor, owing to the low price of dolomite. Professor Frank, of Charlottenburg, has advocated the use of magnesia as a substitute for plaster of Paris for casts, and Grundmann has recently shown the advantage of employing a mixture of magnesia and powdered marble for this purpose. The author states that he has found, following the directions given by Hirzel, that a mixture of benzine and magnesia is the very best possible substance for the removal of grease from drawings or from any other material.—*Proc. Inst. Civil Eng.*

Improved Dredger for the Manchester Ship Canal.—There was launched on the 15th of July, from the works of Messrs. Wm. Simons & Co., Renfrew, the powerful four-screw hopper dredger, "Manchester," which has been constructed to the order of the Manchester Ship Canal Company under the direction of their engineer, Mr. E. Leader Williams, M. Inst. C. E. This dredger is one of a new type, and possesses several novel and interesting features in design and construction. A difference in this from other hopper dredgers is in the stern being divided instead of the bow for the projection of the bucket ladder, and in this manner having a solid instead of a divided bow, which is better able to withstand heavy seas. Another point is the mode of propulsion. This is effected by means of two lines of steel shafting carried fore and aft, to which are fitted four steel propellers, *viz.*, two at bow and two at stern. This enables the vessel to steam up a narrow and crooked channel more easily and commence dredging operations, and run out to sea again without the necessity of turning, as the vessel is designed to steam either ahead or astern with equal facility, a considerable saving of time and less risk of accident being the result. Three large rudders, *i. e.*, two at the stern and one at the bow are provided for the purpose of rapid steering, and these are controlled from the bridge—which is forward of the funnel—by means of steam steering gear. The hull is constructed chiefly of steel, and is subdivided into 10 watertight compartments. The hoppers, which are placed amidships, have a capacity for 850 tons of dredgings, and the bucket girder is fitted with an endless chain of steel buckets working in a central well opening through the stern of the vessel, and is adapted to dredge to a depth of 35 feet below the water level. The vessel has been fitted with the builders' most recent improvements, also with their patent traversing bucket ladder by means of which it is enabled to cut a channel in advance of the stern through banks and other ordinary material, or in other words dredge its own water to float in, thus obviating the necessity of waiting the return of the tide. The dredger is fitted with two sets of triple expansion three crank engines and two steel multitubular boilers, for a working pressure of 150 pounds per square inch. The high-pressure cylinder has piston valves. Steam starting gear is provided. An auxiliary steel donkey boiler is provided for supplying steam to any other of the auxiliary engines; it has also a connection for circulating the water when raising steam in the main boilers. The buckets have a capacity to load the vessel with ordinary material in an hour. The buckets themselves are a specialty and patent of the constructors. They consist of a set of steel backs with links cast on, and these are so designed that they can be fitted with removable and interchangeable steel bodies and lips. In this way the large bodies can be removed from the chain of bucket backs without breaking its continuity, and when hard material has to be dredged, a set of special steel bodies of lesser capacity can be fitted on the same bodies, and say every third back can be fitted with ripping claws, or picks, for disintegrating the material. In the dredging gear, improved frictional arrangements are fitted between the engines and the top tumbler, for the purpose of taking the strains arising from sudden shocks to the dredging machinery when working in hard ground. Beside the dredger's own hopper shoots, side shoots are also fitted for loading barges. At the bow and stern improved steam crab winches for controlling the mooring chains are fitted. Towing gear is also provided. The construction of the "Manchester" was superintended by Messrs. J. P. De Winton and F. G. Carey, acting on behalf of the Manchester Ship Canal Company.

PERSONAL.

H. A. Pevear, president of the Thomson-Houston Company, has left for Alaska, where he will spend a few weeks.

Professor Wm. P. Blake has gone to the neighborhood of Shullsburg, Wis., to inspect some lead and zinc mines, and will return to New Haven about August 1st.

Mr. E. R. Neely, the New York agent of the Wall Street Mining and Milling Company, has left for Helena, Mont., and will visit the company's property while there.

Capt. R. T. Devier, of Wheeling, W. Va., who for seven years past has been a director of the Bellaire Nail Works, of Bellaire, Ohio, has been made vice-president of the company.

I. Grove, of the Brier Hill Iron and Coal Company, Youngstown, Ohio, has resigned to accept the position of general manager of the Colerado Coal and Iron Company, at So. Pueblo, Col.

The following is a provisional list of the papers to be read at the meeting of the Iron and Steel Institute in October:

"On American Blast Furnace Yields." By Mr. James Gayley, Pittsburg, Pa.

"On Testing Materials of Construction in the United States." By Messrs. Hunt & Clapp, Pittsburg, Pa.

"On the Manufacture of Steel in the United States." By Mr. Henry M. Howe, Boston, U. S. A.

"On the Thomson Electric Welding Process.' By Professor Thomson, of New York.

"On the Manufacture of Spirally Welded Steel Pipes in the United States." By Mr. J. Bayles, New York.

"On the Development of the Iron Manufacture of Virginia." By Mr. E. C. Pechin, Cleveland, Ohio.

"On the Use of Water Gas in the United States." By Mr. B. Loomis, Hartford, Conn.

"On the Coke Industry of the United States." By Mr. J. D. Weeks, Pittsburgh.

"On Recent Progress in the Manufacture of War Material in the United States." By Mr. W. H. Jaques, Bethlehem, Pa.

"On the Composition and Wearing Qualities of Steel Rails." By Dr. Chas. B. Dudley, Altoona, Pa.

At the international meeting at Pittsburgh, in addition to the expectation that Sir I. Lothian Bell and Dr. Wedding will present papers; two have been announced by name.

"On the Protection of Iron and Steel Ships against Foundering from Injury to their Shells, including the use of Armor." By Sir N. Barnaby. K. C. B., London.

"On the Recent Development of Marine Engineering." By Mr. A. E. Seaton, Hull.

OBITUARY.

William H. Woodruff died on the 24th inst., at Cranford, N. J. He was born near Elizabeth in 1822, and was formerly well known in this city as Secretary of the Lodi Manufacturing Company, a pioneer establishment in the manufacture of fertilizers.

Henry Mannsell Schieffelin, formerly of Schieffelin & Fowler, the well-known wholesale druggists of this city, died on the 23d inst., in Alexandria, Egypt, whither he went in October last. Mr. Schieffelin was in his 81st year, and retired from business many years ago.

Morris Belknap, of the City of Mexico, died in Louisville, Ky., suddenly on the 19th inst. He was a son of J. A. Belknap, of New Orleans. He served in the Southern army and graduated afterward from a French engineering school, and was for years with the Louisville & Nashville, and later with the Georgia Central Railroad as General Manager. Two years ago he resigned the latter place to establish a bank in Mexico.

Henry J. Davison, Sr., a well-known engineer and a prominent citizen of this city, died suddenly July 22d at Liverpool. Mr. Davison was 55 years old. He started as an apprentice with the Chelsea Iron Works, and when he was 20 the Novelty Iron Works took him as its foreman. A year later he was sent to New Orleans, and built the two great Bogardus baking ovens, costing $400,000.

After this Mr. Davison entered into the building of all sorts of iron structures for the South American States. His labors in this direction gave him great distinction, especially the construction of the telegraph system in the Republic of Colombia. For the last fifteen years he devoted himself entirely to gas enterprises and the construction of gas plants. His work is represented in the gas plants of nearly all the large cities in the country. His was the controlling brain of the big gas syndicate whose latest move was the purchase of the entire gas plant of Indianapolis last spring for about $4,500,000.

Dr. Christian Henry Frederick Peters, professor of astronomy in Hamilton College, Utica, N. Y., died at his home in Clinton, N. Y., on the 19th inst. He was celebrated outside of scientific circles for the number of comets and asteroids he discovered. He was born at Coldenhüttel, Schleswig, September 19th, 1813, educated at the University of Bealin, and, after receiving from that institution, in 1836, the degree of Ph.D., continued his studies at Copenhagen. He came to this country in 1853 on the recommendation of George P. Marsh, and secured a position in the United States Coast Survey. At first he was stationed at the Cambridge observatory, and later at the Dudley observatory, Albany. In 1858 he was called to Hamilton College as the first director of the Litchfield observatory, and in 1867 was made professor of astronomy in addition to his directorship. Under the auspices of the regents of the University of the State of New York, he determined the longitude of several places within the State, including the western boundary line. He had charge of one of the parties sent to Des Moines, Ia., to observe the solar eclipse of August 7th, 1869, and was the head of the government expedition sent to New Zealand to observe the transit of Venus, December 9th, 1874. He was the most successful of all the observers at that station, and he secured 237 photographs of the transit. He was a member of numerous scientific societies, and in 1887 received the Cross of the Legion of Honor from the French government.

INDUSTRIAL NOTES.

The Scranton, Pa., Steel Company made during the six months ending June 30th, 101,441 gross tons of steel rails.

The large Joanna furnace in Robeson Township, Berks County, Pa., which has been idle since last fall, has resumed operations.

The Secretary of the Navy has appointed a board to conduct a competitive trial of armor-plates at Annapolis on August 15th.

The Cummings Iron Works at Hammond, Ind., have been purchased by a syndicate, which, it is said, will increase the plant and employ 500 hands.

The furnace of the Kirkland (N. Y.) Iron Manufacturing Company has been blown out, owing to the dullness of trade and a large accumulation of stock.

The extensive machine works of J. C. Todd, one of the oldest manufacturing establishments in Patterson, N. J., was destroyed by fire early on the 20th inst., entailing a loss of about $150,000.

The Beaver Tube Company, chartered with a capital of $1,000,000, will start work on the plant and build a town near Lewisburg, W. Va. A big coal and coke enterprise will also be begun in connection with the works.

The Pratt & Cady Company, of Hartford, Conn., will build a new foundry building 250 feet long by 75 feet wide, which promises to be one of the most complete buildings of the kind in the New England States. The building will be designed and built by the Berlin Iron Bridge Company, of East Berlin, Conn., the side walls being of brick and the balance of the building being of iron. The building is divided into three parts, the central portion being 35 feet in width with two wings, each 20 feet in width. Through the central portion there will be a 10-ton traveling crane running the whole length of the building.

An iron cupola at the foundry of Cassidy & Adler, in 55th street, this city, exploded on the 18th inst., fatally burning one man, and severely injuring by burning and by flying bricks and other missiles fifteen others. The explosion was very violent, opening a hole in the shell about four feet wide and five feet high, and projecting portions of the shell and its lining some thirty or forty feet. The neglect of the workmen to provide a vent for the gases imprisoned under a crust formed on the surface of the mass in the cupola has been mentioned as the cause, but this is evidently insufficient to account for it. An explosive mixture of gas and air seems to have been formed in some way, but how this could be done does not clearly appear.

The Moore Manufacturing and Foundry Company, Milwaukee, Wis., issues an illustrated catalogue and price list of date July, 1890. They refer to the following goods added to their line since the issue of their 1889 catalogue, namely: Two new barn door hangers and two new elevator door hangers, the latter in various styles of ornamentation and finish and all containing their self-locking loose axle. In tackle blocks they call attention to new styles, more especially for coal and ore handling and other heavy hoisting. They have added largely to their line of hot air registers, both round and square, in electro-plating and bronze finish. The largest addition, however, is in wire workers' goods, which include neat patterns of pickets, rosettes, fence posts, stable fixtures, etc.

Another addition is being made to the Allegheny Bessemer Steel Works, at Duquesne, Pa. At present they have eight separate soaking pits where they heat the steel preparatory to rolling, and which they use in place of a blooming mill. They are now going to erect eight more pits with a heating capacity of 32 ingots every 20 minutes. The new pits will be built on a better plan than the old ones, and will be placed under one building which will be about 50 feet by 80. The present capacity is insufficient to work the steel made in the converting mill. The new cupola which has been in course of erection the last few months was put in blast a week ago. The new hoist which is being built to supply the increased needs of the cupolas will be completed in a few days.

A despatch from Pittsburg, Pa., says: "The strike of the puddlers and helpers of Jones and Laughlin's mills, coupled with the trouble at the National Tube Works, at McKeesport, seriously threatens the power of the Amalgamated Association of Iron and Steel Workers in this district. The men held meetings on the 19th inst., in anticipation of the steel workers and finishers joining the strike, as the lately signed rules of the Amalgamated Association are also obnoxious to them in some respects, as they provide no pay for overtime. Unless these rules are changed, it is probable that all lodges connected with the Jones & Laughlin mills will withdraw from the association. The puddlers of the Republican Iron Works held meetings on the 20th inst. Their grievances are the same except that in addition they complain of hard iron and demand that their firm stop using iron made at the National Rolling Mill, at McKeesport, which is designated as non-union material. The strike has now terminated and the men have returned to work.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

963. Forty tons of 16-pound steel T rails and two street railway passenger coaches. Tennessee.

964. Elevators, bolts, anchors, pulleys, steam heating apparatus, and boiler for five story building. North Carolina.

965. Latest improved machinery for crushing gold quartz and saving the gold. Michigan.

966. Stand-pipe, 15 x 18 feet. 25 H. P. boiler, and one or two pumps capable of raising 300 gallons of water per minute from 124 feet below the surface up into stand-pipe. May also want a few miles of mains. Alabama.

967. Ice machinery. North Carolina.

968. Saw and planing mill of 2,000 feet capacity, also machinery for door, sash and moulding factory. Florida.

969. Second-hand air compressor capable of transmitting 80 to 100 H. P. 4,000 feet.

970. Second-hand, double end street car with seating capacity for 16. Arkansas.

971. Five ton ice machine, complete. Georgia.

972. Engine, boiler, sugar cane mills, cotton ties and roofing. Alabama.

973. Head blocks and carriage for saw mill. Louisiana.

974. Machinery for canning factory with a capacity of 1,200 cans per day. Texas.

975. Machinery for manufacturing spokes, axe hoe and rake handles. Georgia.

977. A 15-ton ice machine. Alabama.

978. A drilling machine that will take out a core of from two to five inches in diameter, for exploring in sandstone. Michigan.

979. Sheet metal letters for signs, in large quantities. Wisconsin.

980. Two pumps, two boilers, one stand pipe, several miles of water pipe, hydrant and other materials for water-works. Texas.

981. Bismuth. California.

AMERICAN GOODS WANTED ABROAD.

956. Prices and particulars of latest improved machinery for large central sugar factories, particularly boilers and centrifugal machines and turbines. Martinique.

957. Estimates for lighting streets of a city of 25,000 inhabitants, where water power can be supplied. Martinique.

958. Correspondence with manufacturers of brown coal or lignite briquette machinery. Australia.

959. Samples and prices of bags for shipping cocoanuts. United States of Colombia.

960. Machinery for extracting cocoanut oil. United States of Colombia.

961. Catalogue of strong, plain carriages, with seats for two and for four persons. United States of Colombia.

962. Correspondence with manufacturers of glassware, tinware, furniture (chairs specially), lamps and lamp chimneys. West Indies.

976. Machinery for manufacturing Portland cement-concrete tubes for sewerage and drainage purposes. Peru.

982. Salmon, oysters, butter, lobsters, preserved fruits in one-pound tins; also American asparagus in ordinary sized tins. Chili.

983. Condensed milk, cheese in the English chedder system (finest), cooked ox tongue, compressed corn beef, and candles in packages. Chili.

984. Hams and bacon of finest quality. Chili.

985. 1,000 Mason patent glass jars to hold two pounds net of preserves, to be packed in cases of 50; each jar to be encased with wood or paper wrapper, which will be supplied by us. Cases to be neatly made of one-inch white pine something like butter cases. West Indies.

986. Quotations net f.o.b. for nests of trunks, 20, 24, 28, 32 and 36 inches long, in lots of 25 to 50 nests. West Indies.

987. White mountain hanging hammock chairs in lots of 20. West Indies.

988. India rubber stamps. West Indies.

989. Quotations f.o.b. New York on complete plant for canning (especially fish); want list of everything needed, such as boilers, engine, kettles, machines for making and soldering cans, making boxes, etc. Republic of Colombia.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including July 9, were as follows:

		Tons. 1890.	Tons. 1889.
Marquette, Marquette District		496,286	568,136
St. Ignace,	" "	15,499	19,155
Escanaba,	" "	515,809	389,717
"	Menominee "	775,098	650,949
"	Gogebic "	115,596	105,575
Ashland,	"	886,542	539,385
Two Harbors' Vermillion District		281,931	325,725
Total, tons		3,086,761	2,508,642

ALABAMA.

(From our Special Correspondent.)

Recent communications from Montgomery state that De Bardeleben Coal and Iron Company, the Bessemer Steel and Iron Company and the Little Belle Iron and Steel Company, all near Bessemer, have been consolidated under the name of the De Bardeleben Coal and Iron Company. The capital stock of the company is to be $10,000,000, divided among the three properties according to the value of each; $3,000,000 in six per cent. bonds, to run for 20 years, are to be issued to secure the mortgage on all of the property of the consolidated company, the old stock of each company to be retired and consolidated stock to be issued in its place.

Until the furnaces of the Bessemer Iron and Steel Company and the Little Belle Iron Company are completed and blown in, the profits of operating the De Bardeleben furnaces go solidly to the present stockholders of that company. This consolidation makes one of the strongest manufacturing corporations in the country.

ALSAKA.

(From an Occasional Correspondent.)

DOUGLAS ISLAND, July 1.

On the Mexican property, which for some time did not show up as the owners expected it—a matter of public concern, as the prospective prosperity of Douglas Island to some extent depends on the mine's success—a fine body of ore has lately been encountered which averages well. Its extent is as yet unknown, but it must be of good size, as the power drills have been cross-cutting on it for several days and are still in it.

Willoughby & Wave have their Huntington mill on Admiralty Island ready and the first trial run gave satisfactory returns.

Mr. A. Campbell will soon have his mill ready in the Basin, and everybody thinks he will do well. It is with him not a question of ore so much as the proper method of treating it.

THE BEAR'S NEST.—This property lies idle, and it appears that Mr. Bernhardt and his experts have other more important business. Even the firm believers in Mr. Bernhardt and his experts begin to shake their head. It is rather queer that Mr. Bernhardt, who is such a heavy loser by the Bear's Nest deal, and who together with his experts discovered such large bodies of pay ore, as is stated in the Alaska *Free Press* here, on the Bear's Nest ground, which the old management failed to find, should let such a valuable property lie idle.

EASTERN ALASKA MINING AND MILLING COMPANY.—This company started up its mill in Silver Bow Basin a few weeks ago. I have learned nothing as to its workings.

TAKOU UNION.—This property remains idle. Reports have it that the owners got into litigation.

CALIFORNIA.

NEVADA COUNTY.

BRUNSWICK CONSOLIDATED GOLD MINING COMPANY.—Mr. H. R. Lounsbery, treasurer of this company, received the following letter dated July 17th, from the superintendent of the mine: "I have employed for the week ending July 17th six men. This will be the average number I will need until I commence getting out ore from the bottom level. I am working night and day and am making progress in getting at the bottom of the mine. Several minor breaks have occurred to parts of the machinery, but of little importance. Still it delays me, since I am not using 15 inches for all my work, pumping and hoisting. I am in hope of reaching new ground at the end of this week and expect to find some good ore. Everything is now running smoothly and the mine is in the best of repairs. I will not have to spend any money for timber as I can cut on the company's ground sufficient of it for the stopes and drifts. I find that the mine makes but little water and that will enable work to go on much faster in my prospecting. The Idaho still continues to extract good ore from the new ground, and their stopes are still going east and up to our ground. The ore averages $20 per ton.

COLORADO.

GUNNISON COUNTY.

EUREKA OIL AND GAS COMPANY.—Articles of incorporation of this company have been filed. The incorporators and directors for the first year are John Corcoran, Andrew B. McGill, Joseph M. Smith, Peter S. Ray and G. M. Norton, Jr. The life of the company is 20 years, the capital stock $600,000 in $1 shares, and the scene of operation Arapahoe and Douglas Counties, Colorado, and Idaho and Wyoming. The object of the corporation is to prospect for petroleum, coal, natural gas and minerals, and to lay a pipe line to Denver if discoveries warrant such a course.

OHIO CREEK ANTHRACITE COAL COMPANY.—Assistant Secretary Chandler on the 18th inst., affirmed the decision of the commissioner of the general land office of March 29, 1888, in the case of this company against William Hinds. On May 27, 1887, Hinds filed a pre-emption declatory statement, alleging settlement May 11, 1885, upon a tract of land in the Gunnison land district. When final proof was made the coal company, by its president, W. L. Yule, filed a protest against the acceptance of Hinds' proof. Hearing was subsequently had and upon the evidence submitted it was recommended that Hinds' proof be accepted. An appeal was taken to the commissioner who reversed this decision and sustained the contest. From this decision Hinds appealed to the secretary. It appears from the record that some time prior to October, 1883, the land in question with some 4,000 acres of adjoining coal lands had been purchased from a party having color of title by the Mount Carbon Anthracite Coal Company, of which the Ohio Creek Company is the successor. At the time of the purchase there were three or four houses on the land, one of which had previously been used as a hotel. In August, 1883, W. L. Hinds, the claimant's son, occupied one of these houses as superintendent of the Mount Carbon Company, where, during the following October, he was joined by his father, the claimant in this case and a director in the company. The property of the Mount Carbon Company was later conveyed to the Ohio Creek Company. In the course of such reorganization the claimant bought at sheriff's sale certain personal property of the Mt. Carbon Company and afterward transferred the same to the Ohio Creek Company, of which he became a director and his son the superintendent. Both continued to reside upon the land until 1887 when the son resigned The improvements on the land, valued in all at about $8,000, were mainly made or paid for by the Ohio Creek Company. Judge Chandler finds that the claimant went on the land and during at least the greater part of the time covered by his proof remained thereon simply as the representative of the companies named and not with the intention of acquiring rhe same under the pre-emption laws and consequently he cannot be said to have been a settler thereon within the meaning of the pre-emption laws. The commissioner's decision is therefore affirmed. The claim of the Ohio Creek Company to the land involved is not presented in this record and no ruling is made in regard thereto.

LAKE COUNTY.

The following is a statement of the amount of lead carbonate ores mined and shipped to the Leadville smelters for the month of June:

Smelters.	No of stacks.	Tons of ore treated.	Tons of bullion.
American	4½	4,950	490
Arkansas Valley	4	4,800	475
Harrison Reduction Works	2	2,400	150
Elgin	2	2,200	175
Total	12½	14,350	1,290

GEORGIA.

(From our Special Correspondent.)

LUMPKIN COUNTY.

BONNY BANK GOLD MINING AND MANUFACTURING COMPANY.—This is the name of a new company organized under a charter from the State of Virginia. The capital stock of the company is to be $2,000,000, of which $50,000 is paid in for the purchase money and $100,000 for working capital. The principal object is the working of a new gold find in this county, the enterprise is being carried on on a large scale, and it is to be hoped that it will be a success.

CHESTATEE GOLD MINING AND DREDGING COMPANY.—The machinery of this company has been levied upon for the sum of over $6,000 by the Sheriff of Fulton County. The company has given bond, however, and is again at work.

MICHIGAN.

(From our Special Correspondent.)

IRON MOUNTAIN, July 23.

The editors of the Upper Peninsula of Michigan and Northern Wisconsin Press Association—the press of one of the richest mining districts in the world—were in convention at Iron Mountain three days this week. On Tuesday the State Press Association, the membership of which is composed of men representing the agriculture, lumbering and manufacturing interests of the lower peninsula to the number sf 200, met their brothers of the mining country for the first time and many of them on this trip received their first intelligent conception of the magnitude and importance of the upper peninsula mines.

The forenoon was spent in visiting the great hydraulic power plant of the Chapin and Ludington mining companies located at Quinnesee Falls, and the afternoon in an excursion to Norway, including a visit to the Penn Company's mines located in that section. During the evening a banquet was discussed by 500 guests. The usual toasts were proposed and responses made. In addition a number of addresses on the mining industries of the upper peninsula were delivered as follows:

"The Miner," J. B. Knight, *Norway Current*, "Our Copper Mines," F. B. Phelps, ENGINEERING AND MINING JOURNAL; "Gogebic Range," J. J. Simpson, Bessemer *Pick and Ax*; "Iron Mountain's Mines," R. P. Tuten, Menominee range. The lower peninsula visitors left in the evening for St. Paul, en route for the Yellowstone. Wednesday was spent by the U. P. and N. W. P. A. in an excursion to the Florence, Commonwealth, Iron Riser and Crystal Falls group of mines.

As officers of the last named association, H. O. Tifield, of the Menominee *Herald*, was elected president and J. B. Knight, of the *Norway Current*, secretary. The next meeting will be held at the city of Menominee. The general verdict seems to be that "Menominee Range hospitality is all right."

(From our special correspondent.)

HANCOCK, July 23.

CALUMET END HECLA MINING COMPANY.—Indications of an increase in production for this mine are growing stronger continually. Of course the company has met with much misfortune in the last few years, and several times when it seemed that there was likely to be a marked increase in production its machinery was disabled, delays occurred, or the reserve energy was exhausted in extinguishing fire or in making repairs.

There has been a considerable difficulty in taking care of the stamp sand at Torch Lake. The forty-foot sand wheel could raise but little more than the sand from eight heads and the remainder has been running off through a launder but little above the surface, which method, at this point in the lake, cannot profitably be continued any great length of time.

This difficulty is met by erecting a new 50-foot sand wheel. The building to contain it joins the old wheel house on the east. It is 44x75 over all, with 40 foot posts. It is already enclosed and the roof will be finished this week. The foundation for the wheel is practically finished. The work of putting the wheel together will probably begin the first of August.

There are four new shafts that by next summer will be producing—the Red Jacket and the Hecla shafts, numbered 6, 7 and 8. By that time No. 2 Calumet shaft will be thoroughly repaired and ready for rapid hoisting. The importance of this No. 2 shaft will be appreciated when it is remembered that the nearest working shaft to the north is 845 feet, and the stoping ground between them is of the best. The nearest working shaft to the south is No. 2 Hecla branch, which is distant nearly 1,400 feet, and there is considerable ground opened out between them. It can readily be seen that the ground in the space of over a thousand feet would naturally be hoisted through this shaft.

When the new triple expansion engines are set to work, two of them will hoist from shafts No. 2 and No. 3 Hecla, and skips holding 7½ tons of rock will probably be used in place of the three-ton skips now in use.

The erection of the new pumping engine "Michigan" at the stamp mill, which, by the way, is progressing rapidly, will enable the mill to run to its fullest capacity. The erection of the new blister furnace at the smelters is another much-needed addition. Its foundation is already laid.

These improvements and additions are, to a certain extent, a foolish expenditure of money, unless it be that an increased production is intended; for it will be admitted that with no increase over the present production, the expense incurred will greatly overbalance any saving in the cost of production.

Thirteen refining furnaces are now running for the last few weeks, 11 on wire bar and two on ingot. At the mill 13 heads of stamps are running.

The strike at the mills Sunday night was the result of a refusal of General Manager Whiting, to allow the men the full time which they worked,

The men returned to their work last Tuesday morning, on a guarntee that their claims would be granted by the Boston management.

The product of the stamp mills for the week ending July 21 was 789 tons 1,915 lbs against 806 tons 915 lbs, for the proceding week.

KEARSARGE MINING COMPANY.—The exploratory work on the Calumet Conglomerate continues. The showing is better than ever before. The impression among mining men is that the Kearsarge if it does not "strike something" soon, has an unpromising outlook.

QUINCY MINING COMPANY.—A $5 dividend, payable August 18th, to stockholders of record July 23, has been declared. This makes $8 in dividends for the Quincy so far this year. Local holders are figuring on $14 or $15 per share from Quincy this year, and the prediction seems reasonable.

WOLVERINE MINING COMPANY.—This property was one of the richest on the Lake, although small. It will last several years, and with good management will show a good product.

MICHIGAN SANDSTONE.—Senator Thomas Dumstan, Edward Ryan, Daniel Crawford and some others have made the preliminary organization of a quarrying company and have an option on a piece of land north of Baraga. They started a diamond drill last Friday.

MISSOURI.

(From our Special Correspondent.)

JASPER COUNTY.

JOPLIN, July 21.

There was a large output of ore during the week ending Saturday. The weather, though quite warm, was favorable, and as a rule the miners put in full time. The sales of ore, however, were not so large as they should have been, as the ore buyers did not seem anxious to take everything offered. The zinc smelters are reported to have large reserve stocks on hand. The average price paid for ore during the week was $23 per ton. The present output of zinc ore from this district demands more smelters and we hope to see some of the smelting schemes so much talked of soon materialize. The following are the sales of ore from the different camps:

Joplin mines, 1,383,020 pounds zinc ore and 189,790 lead; value, $21,103.50.

Webb City mines, 2,193,270 pounds zinc ore and 53,480 lead; value, $28,788.74.

Carterville mines, 239,550 pounds zinc ore and 44,340 lead; value, $4,016.14.

Zincite mines, 316,560 pounds zinc ore and 4,800 lead; value, $3,914.40.

Lehigh mines, 166,810 pounds zinc ore; value, $2,087.

Galena, Kans., mines, 630,000 pounds zinc ore and 180,810 lead; value, $10,680.

Total value, $70,529.78.

The Fort Scott & Memphis railroad was short of cars last week, and for that reason the shipments from Zincite were curtailed. The Standard shipped nothing from the company shaft, and the Holden mines held over about 75 tons. The Diamond Company is still pushing development and opening up new ore bodies.

There are now ten producing mining lots on the Snyder Bros.' lease, and last week they mined and sold 327,770 pounds zinc ore and 29,100 lead.

The Astor Mining Company is opening up a wonderful body of zinc ore, and last week turned in 60,330 pounds zinc ore and held over about 10,000. It has become necessary to increase the jig capacity, and contracts are let for crusher rolls and jigs.

Col. Humphrey, of Denver, Colo., has purchased a half interest in the Cook and Underwood mine on the Oswego land.

A good strike of zinc ore was made Saturday on the Connor land south of Carterville at a depth of 117 feet. This is an undeveloped part of the land and the first ore found. The value of the Center Creek Company's turn in of Webb City last week was $26,730.89.

Thomas C. Clary, of Kansas City, is in town in the interests of the Little Josie mine on the Interstate land. He will put in a new plant of machinery at once.

H. B. Paine and others, who recently purchased the Diamond mines, held an important meeting Saturday, and as a result it was decided to put in new and improved machinery and add to the working force of miners, with a view to getting out the greatest amount of ore in the shortest possible time at the least expense. This company purchased the mine one month ago for $50,000, and the output since has convinced them that there is big money to be made in operating a lead and zinc mine.

Howard M. Holden, president of the Kansas City Mining Exchange, made his second visit to this district last week, and made a very careful investigation as to the workings of the lead and zinc mines. Mr. Holden said that while he was satisfied to hold his mining properties in Leadville and Aspen, Col., he thought the profits from a mine in this district would be greater than the profits from the mines of Colorado. Mr. Holden, like many other Western mine operators who have visited Joplin within the past year, recognizes in the growing city many virtues.

Mr. D. Boaz, of the Great Western Lead and Zinc Company, arrived in the city this morning, and finds several new shafts being sunk on his land east of the city. His first shaft that struck ore at 40 feet, is still improving, and the miners will commence drifting. Your correspondent made an examination of the ore they are now taking out, and must say it is certainly fine.

T. A. McCleland, formerly of Joplin, but now living in Kansas City, came in this evening to look after his real estate and mining interests.

Mr. W. B. Knight, of Kansas City, a civil and electrical engineer, who has superintended the building of some of the largest and best equipped electric street railways in the country, was in the city last week and secured the contract for building the electric railway line in Joplin.

MONTANA.

SILVER BOW COUNTY.

ALICE GOLD AND SILVER MINING COMPANY.—The Alice mine proper is the oldest mine in the district, and has been in continuous operation since it first started, over fifteen years ago. At the present time there is a great deal of prospecting going on, yet the mine, in connection with other properties of the Alice company, is furnishing its quota of ore for reduction at the mills.

The Magna Charta mine, located a short distance east of the Alice, also belongs to the company and furnishess its proportionate amount of ores for the mills. The Waldamere mine located immediately east of the Magna Charta, is also furnishing a proportionate amount of ore. The Boston mine, lies northeast of the Waldamere. The company built a good hoist on this mine a few years ago and did a large amount of good prospecting and milled some good ore, but owing to the mines nearer the mills being in condition to furnish enough ore to keep the mills running, this mine waa shut down, and with the present milling capcrity it can only be calied a reserve supply.

The Blue Wing mine, also belonging to the company, is situated between the Alice and Lexington. The shaft was originally an incline, but was changed last winter to a perpendicular, and a new hoist built in the place of the old one. They have been sinking, and are now cutting the station at the 500-foot level. About 80 men are employed here, and the daily shipments amount to about 15 tons of high-grade ore.

The Rising Star mine, located west of the Moulton, has a complete hoisting plant. The perpendicular shaft is down to the 500-foot level. The work being done at this mine is prospecting and stoping. Twelve men are at work, and the daily shipment of ore is about eight tons.

The reduction works of the company consist of two dry crushing mills, 20 and 60 stamps respectively, their daily work being about 130 tons. During the past two years extensive repairs have been done to these mills.

There was on the pay roll for the month of June 328 men, the amount of money paid out by this company for wages alone being in the approximate of about $36,000 for that month.

ANACONDA COPPER MINING COMPANY.—A press despatch from Butte, dated the 19th inst., says that a dispute that may assume serious proportions has arisen between the Montana Union Railway Company and the Anaconda Company. The smelter of the latter is situated at the town of Anaconda, 28 miles from Butte. About a hundred cars of ore per day, besides nearly that many more of fuel and supplies are shipped to the smelter. Under a contract made when copper was at its lowest, the railroad company claims that it has lost money all along at the rate then adopted; and Manager Baldwin, of the Montana Union has rendered a bill to the Anaconda Company amounting to about $4,000 for switching charges for fuel and supplies at the smelter. This the Anaconda company refuses to pay, and declares that sooner than pay the demand it will shut down mines and smelter until it can build a road of its own. Ore is being shipped from the mines to the smelter in limited quantities, but if the fuel and supplies are cut off it will only be a few days ere work at the mines and smelter will cease, as the ore bins have only a limited capacity. Representatives of both companies are firm. The yards at Anaconda are now blocked with unloaded cars. The railroad company says it has plenty of roundhouse room and can house all the engines in service there until they are needed. The consequences will be another black eye to the town of Anaconda, which was just beginning to recover from the stoppages occasioned by the fire at the smelter eighteen months ago and the fire in the Anaconda and St. Lawrence mines last winter, both of which occasioned a lengthy shut-down each time. The high price and low stocks of copper, however, are the only reliance that the Anaconda Company will endeavor to come to terms with the railway company. Mr. Haggin is on the water on his way to Europe, and he is the only man who can authorize Manager Daley to pay the bill. President Adams of the Union Pacific is part owner of the Montana Union, and is firm, and insists that Mr. Baldwin shall not yield.

LEXINGTON MINING COMPANY.—Recent developments in the Lexington mine would indicate that the outlook for a body of ore on the 1,500-foot level is good. The shaft of the Lexington is in reality only 1,465 feet deep, but it is called the 1,500. Drifting west on the north vein from the bottom of the shaft is progressing, considerable ore being encountered in the vein.

There has been a great deal of development work done in the Lexington mine, 20,600 feet of drifts, 20,600 feet of cross-cuts and 9,080 feet of winzes and rails, besides the 1,465-foot shaft having been made. At present the mill, containing sixty stamps, fifty of which csush ore and the other ten salt, is dropping only twenty-five stamps on ore and three on salt, the other portion of the mill being repaired. It is thought, however, that the mill will be in operation again shortly. During the year 1888 the company turned out 749,883 ounces of silver, 7,224 ounces of gold, and about 40,000 pounds of copper, while during 1889 the production was 640,937 ounces of silver, 6,876 ounces of gold, and 35,000 pounds of copper. Owing to the vast amount of development work being done in the mine this year, and the repairs to the mill, the output will not be quite so large as the two preceding years; but up to the 1st inst. the mine had produced $260,000.

The number of men in the employ of the company is between 230 and 240. The company owns, besides the Lexington proper, seven claims, all of which are in operation. The cost of the machinery in use was $320,000, and the number of tons of ore crushed daily by the stamps when all are dropping is between 80 and 90.

NEVADA.

ESMERALDA COUNTY.

DURAND TUNNEL COMPANY.—Articles of incorporation of this company have been filed with the Secretary of State. The object of the corporation is to carry on the business of mining, milling and tunneling for gold and silver in the State of Nevada. Principal place of business, Aurora. Capital stock, $1,000,000, divided into 50,000 shares of the par value of $20 each. Trustees—R. K. Colcord, John F. Barr and John Neidy, of Aurora, and A. M. Ardery and C. F. Bicknell, of Carson.

STOREY COUNTY—COMSTOCK LODE.

The Virginia *Enterprise* says: The Yellow Jacket people are putting in a large new air compressor at their hoisting works. This is required by the renewed activity in mining operations conducted through the Yellow Jacket shaft, not only in the Yellow Jacket, but in the Confidence, Challenge and Imperial mines, north of the Jacket. In all of these mines prospecting work is being prosecuted on the several levels with greater energy than probably has ever been displayed before. In the Yellow Jacket a strange occurence has been found, though it is not by any means phenomenal. Right in their ledge of free milling gold and silver bearing quartz, on the 500 level, they have encountered a lot of base ore, which cannot be worked by the amalgamating process. The quartz is as likely in appearance as any they have in the mine, and the black base ore in it strongly resembles the regular Comstock free milling ore. It is hoped and believed that they will soon work out of this base and again encounter free milling ore. The base ore found in the Yellow Jacket is not the only base ore found on the Comstock, but it is the only ledge known to contain both characters of ore—milling and smelting ores. In the Gold and Curry there is an independent ledge of base ore.

OHIO.

OIL.

It is reported at Findlay that the Sun Oil Company, the largest of the independent companies operating in that field, has sold out to the Standard, and that the transfer of the property, which consists of a refinery, tank cars, pipe line, wells and leases will be made next week. The consideration is a matter of speculation, as both parties to the sale refuse information, but it is likely the Sun Company obtained at least $1,500,000 for its interest in the Ohio field.

PENNSYLVANIA.

COAL.

A fire which started in the Hazleton Mine, at Wilkesbarre, on Monday, was extinguished on Tuesday. The work of retimbering the mine will begin at once. The loss will not be as heavy as was at first anticipated and the mine will be in active operation again by Monday next.

About two months ago William Moore, of Scranton, sold 100 acres of land situated in Dickson Borough, just across the city line, Scranton, to Messrs. Benner, Watkins, and Williams, coal operators. The price was $25,000. Soon after the land had been deeded over, the new owners erected and commenced drilling with a McEthen mine drill upon the place. On the 16th inst. the drill broke through a vein of coal 10 feet thick at the depth of 150 feet. The coal is reported to be of the finest quality. The value of this land now is estimated at over $1,000,000. This opens up a new coal sub-field, and in a locality where the presence of coal was not even suspected.

VULCAN COAL AND COKE COMPANY.—The Shoff Colliery of this company, near Madera, on Little Morgan run, has been running steadily this season under the supervision of Mr. James McGunegal, formerly from the Monongahela River, who made the opening into the Moshannon seam. He now has about 120 men and boys employed. The scarcity of cars at this time is causing some broken time. The Atlantic No. 2 mine of the Berwin-White Mining Company is located back on this branch. Mr. Wm. Pollock, formerly of the Franklin mine in Houtzdale, has charge, employing 130 men. Five of the Osceola manufactured

coal cutting machines are operated in this mine. It has also been losing some time for want of cars.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to July 18th, were as follows:

	1890. Gals.	1889. Gals.
From Boston	1,583,183	2,713,673
Philadelphia	73,240,090	70,650,455
Baltimore	5,410,700	1,898,349
Perth Amboy	7,771,134	10,741,527
New York	220,627,869	226,958,523
Total	308,632,976	312,962,527

UTAH.

BEAVER COUNTY.

HORN SILVER MINING COMPANY.—Mr. A C. Washington, the President of the company, has just issued the following statement for the three months ending June 30th:

April 1st.—Cash balance, per last quarterly report ..... 288,700.83.

RECEIPTS.

Sales of Ore:		
April	$28,936.98	
May	27,086.76	
June	37,419.53	
		93,443.27
Smelter at Francklyn:		
Proceeds sale of slag, Iron ore, scrap iron, etc., sundry rents		2,155.71.
Interest Account:		
Sundry amounts		$140.00
Total		$384,739.81

DISBUSEMENTS.

Mining:		
Labor, supplies, timbering, and dead work		$36,149.57
General Expenses:		
Salaries of manager and clerks, Frisco and Salt Lake City		1,804.09
Chicago Refinery:		
Annual taxes		699.56
Dividends:		
Dividend No. 18, paid from net earnings of current quarter		50,000.00
New York Office:		
Salaries and clerk hire		$1,750.00
Taxes		10.17
Generl office expenses		124.65
Printing and stationery		38.00
Rent of office		100.00
Legal expenss		357.85
Registration of stock		250.00
Petty cash		55.25
		$2,685.92
Balance Cash on hand:		
United States Trust Company	$210,000 00	
First National Bank	43,437 71	
Deseret National Bank	39,784 96	
F. Honkamp, Chicago	154 85	
Petty Cash	23 15	
		293,400 67
		$384,739 81

At the New York office a reporter of the ENGINEERING AND MINING JOURNAL was told that over and above these figures there remained about 350 tons of ore on the dumps unsold. Under date of the 5th inst. the superintendent writes that at the south end of the seventh level they ran a cross-cut to the east and found a large body of silver ore assaying from $70@$146 but low in lead. On the ninth level they found another body of ore of a lower grade running 30 ounces of silver and 30 per cent. of lead. Under date of July 20 we are informed that a winze was run from the eighth level to the ninth level, and ran into a body of ore which assayed 23 ounces of silver and 21 per cent. of lead.

FOREIGN MINING NEWS.

BELGIUM.

THE VIEILLE-MONTAGNE.—The Vieille-Montagne Zinc Mines and Foundries Company, one of the oldest industrial enterprises in Europe, has lately reported progress for 1889. The company produced last year 52,808 tons of rough zinc, 50,173 tons of rolled zinc and 8,587 tons of zinc white. An understanding arrived at between the company and other kindred undertakings for regulating the production of rough zinc in Europe has been attended with the results which had been anticipated. But while the Vieille-Montagne was enabled to obtain better prices for its products last year, the undertaking was affected by three adverse influences which greatly increased the working expenses. The first of these adverse influences was the heavy advance in coal, which was a marked feature in the industrial history of 1889, and which was no small matter for the Vieille-Montagne, since it burns up 360,000 tons of coal annually. The second adverse influence was a rise in wages occasioned by the increased activity observable in 1889 in European industry. The third adverse influence was the higher price of the minerals which the company had to purchase in the course of last year. Notwithstanding, however, all the difficulties of the moment, the Vieille-Montagne realised in 1889 a rough profit of £226,641, or £36,817 more than in 1888. After payment of all the fixed charges for the year, and after carrying £28,006 to the statutory reserve fund, the council of administration was enabled to recommend the payment of a dividend for 1889 at the rate of 31¼ per cent. upon the share capital, a final balance of £300 being carried to the credit of 1890.

BRITISH COLUMBIA.

(From our Special Correspondent.)

NELSON, July 13.

BIG BEND DISTRICT.

MCCULLOCH CREEK.—An application has been made by a company for a 20-years' lease of a bench claim of 160 acres on this creek, to be worked as a hydraulic claim. In 1866, the year of the Big Bend excitement over $100,000 of gold was obtained from this creek. In the following year $100 to the hand was obtained on some of the claims, and rough gold with attached quartz and nuggets were by no means uncommon. Work was resumed in 1886 and has been continued up to date, a considerable amount of coarse gold having been obtained by a bed-rock flume company in 1888. The creek is only four miles long.

The argentiferous galena belt of Illecilliwaet is supposed to run northwards through the Big Bend country, and veins of galena have been discovered on McCulloch and Carnes creeks. Hitherto the country has been comparatively inaccessible.

EAST KOOTANIE DIVISION.

MONARCH.—This claim, located near Field on the Canadian Pacific Railroad, was opened up in the fall of 1888, and the British Columbia Smelting Company (to whom the property then belonged) shipped some 1,500 tons of ore to its smelter at Vancouver. The smelter, however, was a failure owing to faulty construction and bad management. We now hear that an important strike has been made in the mine and that the owners of the Revelstoke smelter have an option upon the property. The ore is galena, often nearly pure, and apparently impregnates a zone of interbedded calcareous rocks. The ore is most favorably situated for shipment, but has hitherto been considered low grade (5 to 12 ounces). The securing of this property would probably enable the Revelstoke smelter to begin work this summer.

WEST KOOTANIE DIVISION.

The United States Government is apparently doing as much for this district as the Canadian legislature itself. The Treasury Department of the United States has now perfected a bonding arrangement at Kootenai and Bonner's Ferry, Idaho, whereby Canadian goods can be shipped in bond from any part of Canada to points on the Kootanie Lake via the Northern Pacific Railway. Hitherto all Canadian goods have come in via Revelstoke and Sproat, entailing the use of pack animals for a distance of 21 miles.

Work on the wagon road to the Silver King group of mines was begun yesterday. The road will cost about $12,000. Toward this amount the government has contributed $6,000; the owners of the Silver King will find the remainder.

Good progress is being made on the railway from Sproat to Nelson, and it is expected that the track will be completed as far as the Slocan River by the middle of August. Very little ore will be shipped from Nelson or Hot Springs until this railway is in running order.

ILLECILLIWAET DISTRICT.

The ore of this district is argentiferous galena, carrying traces of gold. It occurs principally in quartz veins cutting a series of thin-bedded limestones and graphitic slaty shales. The series has an average dip of 40 degrees to the E. N. E., and shows considerable folding. The slates, according to Dr. Selwyn, may be of Cambro-Silurian (Ordovician) age, but no fossils have yet been found in them. A large number of provincial companies own property in this district, but they evidently look upon mining as a holiday hobby. The province sadly needs the presence of a few American mining capitalists, just to show the colonists how mines should be worked.

FISH CREEK.—A promising vein of galena, 8 feet wide, has recently been discovered across the Fish River, near Illicilliwaet, and about 10 miles from the source of Flat Creek.

GLADSTONE.—Some years ago a carload of ore was shipped to Swansea from this mine. The vein is now 8 feet wide, and a portion of it averages $200 per ton in silver. Development work is being done.

MAPLE LEAF.—A small force is at work on this property. Sir James Grant has an option on the mine, and it is understood that Dr. Lawson, of Vancouver, has advised his principal to expend $25,000 upon the property.

SELKIRK MINING COMPANY.—This company has let a contract for several thousand dollars worth of development to be done on their properties. Fifteen men are now at work on the "Lanark," the most promising of their claims. The tunnel on the 500-foot level, which was in 200 feet, will be run 500 feet if necessary, to tap the vein. Several hundred tons of ore have been shipped from the "Lanark" in the past, producing about 100 ounces of silver to the ton. The ore taken out this year will be shipped to the smelter at Revelstoke.

NELSON DISTRICT.

TOUGH NUT.—The necessary survey, etc., having been made, the owners of this property have applied for a Crown Grant—the equivalent of the U. S. Patent.

THE EAGLE CREEK MINING COMPANY.—The company reports that its 10-stamp mill, running on the "Poorman" ore, produces about $960 in free gold and concentrates per 24 hours run. The concentrates amount to 1½ to 2 tons per day. It is expected that the property will soon be purchased by an English company.

HOT SPRINGS CAMP.—Although the number of claims located in this camp—nearly all in the space six miles long by two miles wide, comprised between Coffee and Woodberry creeks—is very remarkable, new finds are being made every week. If only a small percentage of the numerous locations eventually prove to be as valuable as they now promise to be, the district cannot fail to become a large producer of argentiferous lead ore in the course of a few years. Hitherto very little attention has been paid to the east side of the Kootanie Lake, but quite recently several promising locations have been made there; one of the ledges is a copper-silver proposition.

Work was commenced on the government wagon road to the mines on the 9th inst. The road heads for the Skylight claim via the Kras mine. The Kras is the mine that first attracted much attention to the camp. A shipment of $400 worth of ore from this property showed that the camp was not so low grade as had previously been supposed.

At the Blue Bell mine work is proceeding on the upraise connecting the lower tunnel with the shaft sunk on the croppings. The upraise will be used as an air-shaft.

CANADA.

PROVINCE OF ONTARIO.

A dispatch from Ottawa, Ont., says that the Standard Oil Company has agreed to take 23,000,000 cubic feet of natural gas daily at Buffalo from the Provincial Natural Gas and Trust Company, which will lay pipes to Buffalo from its 10 wells in Welland County. The Provincial Company also proposes to supply St. Catharines and other towns along the Welland Canal.

(From our Special Correspondent.)

PORT ARTHUR, July 21st, 1890.

Large numbers of explorers and land surveyors are out on the Aticokan iron range locating iron lands for Canadian, English and American capitalists. Upward of 6,000 acres have now been located on this range, and all that is necessary to bring this iron into the market at once is a railway from Firesteel River, on the Canadian Pacific Railway, to the range, a distance of 40 miles. Experts in iron mining have estimated that the first season's output from these deposits would not fall below 500,000 tons, and could be increased beyond that quantity at pleasure, as on every location so far taken up.

The iron occurs in considerable elevations, from 100 to 150 feet above the surrounding country, as well as in the low-lying lands; consequently, mining to a great extent, at least, would resolve itself into quarrying. The Canadian Pacific Railway company has a standing offer to operate this branch line for one-half the net earnings of the branch. A preliminary or trial line has been run over the ground; the estimated cost of its construction with the necessary equipment is $600,000. No charter has as yet been applied for, but it is the policy of the Dominion Government to grant charters and subsidies to railways designed to develop the resources of the country to the amount usually of $3,200 per mile.

The Ontario government lately adopted a railway policy on the following lines: A cash subsidy of $3,000 per mile, and the mineral, timber or agricultural land for 10 miles on either side of the line are set apart out of the sale of which a subsidy fund is formed, which is handed over to the railway company annually after deducting the actual expense of the department in making the sales. This policy prevents the railway companies from monopolizing the best mineral, timber or other lands contiguous to their line. There has never been a better opportunity for a well conducted railway enterprise to make money than in the building of this branch, as it will be assured from the start of all the traffic it can handle. Just as soon as it is built and in operation, Port Arthur will become one of the greatest iron ore shipping ports on Lake Superior; blast furnaces would be erected, and a profitable iron manufacturing business conducted at this point. At the last session of the Dominion parliament a bill was introduced by the Minister of Finance and passed without opposition, increasing the bounty on pig iron manufactured in Canada from $1 to $2 per ton, and guaranteeing the bounty at that figure till 1897. This bounty, taken in connection with the duty on imported iron, ought to allow a handsome margin of profit to the manufacturers. Large deposits of (siderite) carbonate of iron lie in the immediate vicinity of Port Arthur, containing sufficient lime to furnish the necessary flux for smelting. The erection of silver reduction works at Port Arthur would materially aid in the development of the silver district. The mines now in operation could easily furnish a smelter with 25 tons of smelting ore daily, and when the Port Arthur Duluth & Western Railway reaches Gunflint Lake there ought not to be any trouble in doubling or trebling the quantity, as the construction of the road will cause ten locations to be developed, where one is being worked now. Your corres-

pondent lately interviewed several of the leading mining and business men in this district on the subject of the formation of a prospecting and development company, an idea which they unanimously were in favor of. Hundreds of locations now held by prospectors and others who are unable to open them up, could be cheaply acquired, in their entirety or a controlling interest in them, sufficiently developed to show the quality and extent of the veins and then placed on the market at reasonable figures. This work carried out under able and judicious management could not fail to be profitable alike to the district and the stockholders. The attention of mining men and capitalists is respectfully called to this opportunity, which will bear the closest scrutiny.

CLOUD LAKE SILVER LOCATION.—The title to this property has been in dispute for the past year as the original discoverer did not send in his deposit before a rival claimant. The matter was referred to a commissioner, who held sittings in April last, at Port Arthur. The government has had the commissioner's report under consideration for some time, and has decided that each of the two claimants is to have an undivided one-half interest in the location. It is situated on the N.E. ¼ of Lot 5, Concession II., township of Crooks; comprises 174 acres and has two well defined, strongly mineralized lodes. No. 1 vein has a general northeast and southwest strike, with an average width of 5 feet, and can be traced on the surface for 1,000 feet.

No. 2 vein has an east and west strike, with an average width of 4 feet, and joins No. 1 about midway on the exposed part; from the point of intersection eastward as far as the vein is exposed, it has an average width of 8 feet. A shaft 12 feet deep was sunk at the contact of the two veins. The lowest assays from rock, showing no silver, gave $300, the highest $2,900, per ton. The silver is in the form of argentite and zinc blende. It is the intention of the owners to proceed with the development of the property at once.

THE ELGIN MINE.—So quietly and systematically has work been carried on at this mine that few of the mining communities are aware of the fact that in the Elgin we have a rival to the Beaver, Badger, Porcupine, *et al.*

Development up to date consists of one working shaft of 150 feet in depth, one ventilating shaft of the same depth, and a drift connecting both shafts.

The gangue of the vein is identical with that of the surrounding mines referred to; assays from average samples run from 40 to 10,000 ounces to the ton of 2,000 pounds. The vein, most of which has been left standing on the east wall, will average 33 inches, and shows up rich in argentite leaf and native silver. It is estimated by an expert who examined this mine that there is $45,000 worth of silver in sight. The property contains excellent timber and a never-failing water supply from the picturesque Loch Fyne, part of which is on the Elgin property.

TERRACE BAY GOLD MINING COMPANY.—This property belongs to the McGee estate and comprises 1,600 acres situated on the shore of Terrace Bay, a few miles west of Jackfish Bay. W. Roland, who has lately made a careful examination of the property for the owners, found it to contain several strongly defined metalliferous lodes. The geological formation prevailing throughout this tract generally is Laurentian; occasionally, as toward the northern and eastern limits, rocks of the Huronian age are encountered. The gangue of the veins, as far as tested, consists of fine quartz, of a granular, and in places vitreous, texture and appearance, carrying chalco pyrites, highly auriferous, argentiferous galena and molybdenite, while the walls are invariably cased with slickensided pyro-schists, the matrix being occasionally streaked with red orthoclase. An average of 25 pounds of this copper pyrites yielded, by assay, $13.50 in gold per ton. The principal work was done on location No. 4, where, on a strong, well-defined lode bearing north nine degrees east, a drift was run in for 45 feet. This lode is intersected at intervals of about 10 feet by strongly mineralized "feeders" from the south and east, the lode invariably becoming richer and better defined as it approaches the point of intersection of the drift and stope. Excellent results were obtained by concentrating the ore in this vein.

WEST END MINING COMPANY.—At the annual general meeting of this company, held on the 14th inst., H. N. Nichols was elected president and the following gentlemen directors for the ensuing year: R. Dickerman, F. H. Newberry, Lieut.-Col. Geo. A. Shaw, R. Caddick and A. Falco.

WHITEFISH LAKE DISTRICT.—Several sales have been made lately of undeveloped locations, prices ranging from $1,000 to $4,000 each for locations containing 80 and 160 acres respectively.

CHILI.

Advices from Chili state that the strikers in the nitrate district number 7,000. A conflict occurred between a number of riotous strikers and a body of troops, in which 40 of the strikers were killed or wounded.

MEXICO.

CHIHUAHUA.

SANTA JULIANA MINING COMPANY.—Messrs. Deming and Logan, of this city, have received the following letter from the Superintendent:

July 8.—If all our freight arrives, I think we may have five stamps started before the first of September. The remaining five have not yet been shipped from San Francisco, but all the timber and wood work is being placed and the bulk of the work will have been done when they arrive. In the meantime we shall start five stamps as soon as possible. In Providencia the rains and the extraction of waste from below leaving large openings, leave very large cracks in the walls, which settling gradually, fall inward. This is the state from the tunnel level or entrance to the surface and in this part the work was very poorly done. From this level to the depth which we have reached I regard everything as secure and in a short time it will be filled so there will be no danger; but in the tunnel before we are safe we have to stull the entire length.

July 12.—The men say this morning we are entering into the hanging wall of Santa Juliana. If this is so we should be very near making the connection. We have already shut down the Waterson mill, and in all probability shall never run it again. The expenses are $3,000 per month.

SONORA.

LA DORADA.—Mr. J. MacPherson, of the Consolidated Exchange, gives the following information concerning this gold mine situated in the Ures district: "Work on this mine is being pushed. The 150-foot level is showing up some bodies of ore as the drift is advanced; late reports from the manager state that he has encountered a streak in said level which assays $840 per ton in free gold; the streak is six inches wide, the entire vein is 16 feet wide and averages outside of the streak $40 per ton in free gold. A 30-ton plant has been ordered, and, it is expected, will be in running order in 60 days. The mine is owned by New York capitalists.

NEW CALEDONIA.

In the French colony of New Caledonia the mining industry seems to be proceeding prosperously. The exports of nickel ore in 1889 were 12,000 tons against 6,000 tons in 1888—an increase which illustrates the developing demand for that metal.

NOVA SCOTIA.

CAPE BRETON.

General Manager Capt. I. P. Gragg, accompanied by Geo. Grant Francis, M. E., of London; Pierre Humbert, Jr., M. E., of Boston, and Edwin Gilpin, Jr., Inspector of Mines of Nova Scotia, have just returned from a thorough examination of the Coxheath copper mines in Cape Breton owned by the Eastern Development Company, Limited.

The full reports cannot be rendered for several days, but all the experts unite in stating that the extensive developments the company has been quietly carrying on for the past five years have resulted in proving large values. 22,000 tons of smelting and concentration ores are in actual sight, with large reserves. The new vein discovered last winter shows a width of 8 to 10 feet of ore for 750 feet in length, fairly doubling the previous known value of the property. The reports are to be submitted to some of our well known Boston capitalists, who are contemplating joining in the management of the company. The prospectus of the company states that the mines, once properly equipped, will lay down copper in England at a cost of six cents per pound. Dr. E. D. Peters, Jr., who was to have joined the party, was detained in Arizona by professional engagements, he has previously reported upon the treatment of the output.

MEETINGS.

Benton Consolidated Mining Company, at Room 16, No. 330 Pine street, San Francisco, Cal., July 30th, at 1 P. M.

Consolidated New York Mining Company, at Room 79, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., August 2d, at 12:30 P. M.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Belcher, Nev.	40	June 27	July 31	Aug. 21	.50
Bodie, Cal.	12	June 16	July 22	Aug. 22	.25
Bona Fors, Cal.	1	June 19	Aug. 11	Sept. 5	.05
Con. Pacific	12	June 21	July 28	Aug. 20	.10
Crocker, Ariz.	9	June 16	July 25	Aug. 15	.15
Dexter, Nev.	1	May 29	July 1	Aug. 1	.08
Exchequer, Nev.	29	July 10	Aug. 14	Sept. 4	.25
Golden Prize, Nev.	4	June 19	July 30	Aug. 18	.25
Mayflower, Cal.	47	June 7	July 10	July 31	.30
Silver King, Ariz.	3	June 9	July 17	Aug. 11	20
Standard Con., Cal.	3	June 2	July 1?	Aug. 9	.50
Teirakoff, Cal.	4	June 9	July 26	Aug. 23	.01

DIVIDENDS.

Atlantic Mining Company, dividend No. 13 of one dollar ($1) per share, $40,000, payable August 4th at Boston, Mass. Transfer books close July 23d and reopen August 4th.

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 117 and 118

NEW YORK, Friday Evening, July 25.

The boom of last week proved merely a "boomlet," and this week we return to the old story and report a very quiet market, without features of interest or anything new. The dealers in mining stocks have gone back to their old inactivity with an easy gracefulness that betokens long familiarity with it.

Certificates of the Home Stake Mining Company have recently appeared in Wall Street and have been confounded with those of the Homestake Mining Company which have long been well known at both the Stock and the Consolidated Exchanges. The certificates are lithographed instead of engraved, and state that the company was incorporated under the laws of Illinois with a capital of $4,000,000 divided into 200,000 shares, full paid and unassessable. Imprinted evidently with a rubber stamp is the additional statement that the mines of the company are situated in the Black Hills. The certificates bear the names of I. Boddefeld president, and Albert Strong, secretary. One of these certificates turned up on Thursday. It had been received by a broker at the Stock Exchange from an out-of-town correspondent who asked him on Wednesday to sell some Homestake mining stock. The broker sold that stock and received a certificate which was a puzzle to him. This certificate was plainly marked No. 19 originally, but the figure 5 had been stamped in red ink in front of the 19, making the number 519.

Messrs. Lounsbery & Co., the transfer agents of the Homestake Mining Company, say they know nothing about the other company. It is not alleged by any one that the "Home Stake Mining Company" has any fraudulent designs upon the public, but we wish to warn our readers against mistaking one company for the other. At the same time it will not be amiss to caution people against making the same mistake with the "Silver King Mining Company."

There is a company of this name whose stock is listed at the Consolidated Stock and Petroleum Exchange, and whose property is in Arizona. The other company with the same title was incorporated under the laws of Illinois, and has its property in Michigan. Can any of our readers sends us information relating to the "Home Stake Mining Company" alluded to?

The copper stocks seem to have become favorites. Of Calumet & Hecla 30 shares were sold at $313½@$316⅛. Franklin was traded in $27.88, Kearsarge at $26.38, Osceola at $47.13 and Huron at $9. Quincy shows sales of 50 shares at $127.75 and Tamarack at $231.50.

Of the Black Hills stocks, 1,200 shares of Caledonia were sold at from $2 to $2.05. Deadwood was not traded in. Father de Smet shows sales of 200 shares at 93 cents. Iron Hill, for some time a stranger to the exchange, was traded in at 39 cents. Sullivan Consolidated, also a stranger, was dealt in this week, and shows transactions aggregating 800 shares at $1. Seventy-five shares of Homestake were sold at $10.38.

We note sales among the Colorado stocks of 300 Adams at 1.10. 700 shares of Breece at 50@55c. 5,300 Freeland at 40@49c. 6,063 shares of Leadville Consolidated at 14@15c. 500 Little Chief at 35c. Of Silver Cord 500 shares at 69c. were sold, and 400 shares of Small Hopes at 92c.

We note sales of San Sebastian at 35@40c. It is reported that this company has paid off its debt, but this report could not be confirmed. The sales amounted to 1,000 shares, or more than has been recorded of any one week for months past.

The Comstocks were all lower in price this week. Alta declined from $1.35 to $1.25. Andes shows a solitary sale at 9c. Best & Belcher sold at $4.05; Bullion at $3.40@$3.50, a decline of 10 cents from last week. Chollar declined steadily during the week, and closed at $3.70. Comstock Tunnel was traded in at 18c., and the bonds at 27c. Consolidated Imperial had a solitary sale at 45c., Exchequer at $1.10, Julia at 45 to 50c., and Justice at $1.75@$1.80, have declined this week. Mexican is higher than last week, selling at the close at $3.65. Occidental declined from $,50@$1,40. Scorpion was stationary at 40c. Union Consolidated was traded in this week at $2.95@$3.00. Utah is lower at $1@$1.10 Belcher shows one sale at $2.95. Consolidated California and Virginia declined to $4. Crown Point shows one transaction at $3, and Gould & Curry one at $2.75. Martin White was sold at $1.30. Ophir opened at $4.35, but rallied at the close and sold for $5.25. Savage is lower, at $$4.05@$4.33. Sierra Navada was quiet at $3.83. Yellow Jacket sold at last week's prices, $3.20.

Of the Tuscarora shares, North Belle Isle shows a solitary transaction at $1. North Commonwealth, at $2.75, was traded in to the extent of 40 shares.

Ontario shows sales aggregating 337 shares at $45@$45.25. Horn Silver advanced during the week, closing at $3.60 with 1,500 shares sold. The financial statement of this company, together with some news from the property, will be found in our mining news column. Stormont was traded in this week at 8c.@9c.

Astoria at 4 to 5c. shows sales of 1,800 shares. Sutter Creek opened at 98c., and declined to 85c. Bodie Consolidated, assessment unpaid, sold at 75c. Mono has a solitary sale at 65c. Of Plymouth 100 shares were sold at $7.75. Quicksilver preferred was traded in at $40 to $42.

Some stockholders have from time to time expressed their doubts as to whether the new stock of the Brunswick Consolidated Gold Mining Company would be issued on August 1st or not. Several people have been known to say that had it not been for this lack of definite knowledge the stock of the Brunswick Consolidated Company would have been sold at a very low price. We are assured by the management, however, that the stock will be issued promptly as promised. We are also informed officially that there is enough money in the treasury to enable the company to work until November, and that they hope to have the mill started by that date. This, it is claimed, will obviate the necessity of levying any assessments before that time. Reference to the company's property will be found in our mining news columns.

Santiago was traded in to the extent of 500 shares at 50c.

Silver Mining of Lake Valley shows transactions aggregating 800 shares at 80@85c.

Silver King was traded in at 60c. Mutual Smelting and Mining Company declined during the week, having opened at $1.75, and closing at $1.55.

Rappahannock, as usual, was moderately traded in at 6c.

Phœnix of Arizona is one of the few stocks that excite active bidding and offers at the daily calls of stocks. This week 7,000 shares were sold at from $1.25 to $1.35, the latter figure being the closing price.

Boston. July 24.

(From our Special Correspondent.)

There has been more activity in the market the past week and prices show a marked improvement in nearly all the list. The leading brokers report better buying of the copper stocks, especially the dividend-paying mines, and the strong position of ingot copper warrants the belief that higher prices must eventually be reached for this class, while the speculative list will sooner or later feel the influence of any advance.

The general market is exceedingly dull, and were it not for the copper stocks there would be very little inducement to operate at all. In the market this week we note quite large dealings in Allouez, which advanced from $9 to $10¼, with slight reactions, only to recover quickly when the offerings were withdrawn. The reports state that the estimated monthly product of this mine will be about 208,000 pounds ingot, which at 17 cents per pound would be equal to $1.50 for the stocks for the year.

Arnold advanced from $1½ to $2, and is quite strongly held. Captain Moyle reports a very promising looking vein in the tunnel, which is now in about 60 feet. The stock on its future outlook is cheap at $2 per share.

Atlantic sold up to $28 on the expectation of a $2 dividend, but on the announcement that only $1 would be paid it declined to $25, and subsequently sold at $24½ ex-dividend.

Boston & Montana touched $65½, but lost the advance later, and for some reason has been rather weak the past two days, selling down to $63¼. It is all the better purchase, and is a good stock to hold.

Butte advanced to $24½, but, like its neighbor, had a decline, selling to-day down to $22½. We hear no reason given for the decline in these two stocks.

Calumet & Hecla advanced from $305 to $316, selling at the latter price to-day. The output the last week shows a falling off of 25 tons.

Centennial has been very quiet at $37@$38. Good reports are received almost daily from the mine, and when it again becomes active we look to see it sell much higher.

Franklin has been in good demand all the week and sold up from $23½@$27, reacting to $26. Reports from the Franklin indicate that the development work continues to expose rich ground for copper all over the mine and that ground enough has been opened to last three years.

Kearsarge has developed a weakness from some cause, which does not appear. It sold up to $28½ in the early dealings, but a good deal of stock seemed to be offered on a dull market, resulting in a decline to $25¾.

Osceola advanced to 47½, losing $1 in the later dealings.

Quincy advanced to $131, and later sold ex-dividend ($5 per share) at $129½.

Tamarack advanced from $209 to $227, which was a little too much for it, and it subsequently declined on very small sales to $220.

Of the speculative list there is not much to be said, save that there is no great disposition to trade in this class, although we note very few stocks offered, and none being pressed for sale.

Huron declined from $9¼ to $8¾. National was in demand at $2½@$2¾. Santa Fe steady at 67½@70c.; Ridge, $1¾. Copper Falls sold at $11½, Tecumseh at $7@$7½; Hungarian, 52¼c.; Washington, 45c., and Humboldt, 50@52½c.

The silver stocks have been quiet this week. The recent flurry in Breece caused by covering of shorts culminated and the stock has declined to 40c. Catalpa sold at 45c, Crescent at 18c. Dunkin firmer, sales at 65c. The net profit for June is reported at $2,150. The shaft on the new property is down 100 feet and is looking well.

3 P. M.—The market was quite strong at the close with Franklin up to $27¾. Cal. & Hecla was $313 bid, $315 asked; $500 was bid to call 100 shares at $330, sixty days, with no takers.

By Telegraph.—Kearsarge, $24; Franklin, $27; Calumet and Hecla, $315; Boston and Montana, $63½; Tamarack, $220; Butte and Boston, $22; Atlantic, $24½; Osceola, $46⅝ asked: Huron, $8⅝; Sante Fe, 65c.

Denver. July 22.

Prices and sales during the week ending July 12th, 1890:

Company.	Opening.	H.	L.	Closing.	S.
Alleghany, Colo	22a	16½	16	16½b	1,100
Amity, Colo	05¾b	06¼	05¾	06b	4,400
Bangkok, C. B., Colo	*13	*13	10¼	11b	50,800
Bates-Hunter, Colo	43	44	43	43b	4,000
Brownlow, Colo	13b	13¼	12	11¾b	1,100
Calliope, Colo	36b	36½b	35	35b	100
Cash	30b	35b	30b	30b	.....
Clay County, Colo	*13	*43	41	40½b	3,200
Hard Money, Colo	04½b	05½b	04b	04½b	.....
Little Rule, Colo	58	*63	58	60b	22,700
Matchless, Colo	210b	210b	100b	200b	.....
May-Mazeppa, Colo	75	*79	74	74b	12,200
Mollie Gibson, Colo	60a	60a	20b	20b	.....
Oro, Colo	300b	600a	75b	75b	.....
Pay Rock, Colo	06¼b	06½	06	06b	4,600
Puzzler, Colo	16½b	17	16½	16½b	1,400
Reed-National, Colo	70b	71	71	70b	700
Running Lode	†23	*23	18	19b	500
Silver Cord, Colo	30b	30b	30b	30b	.....
Whale, Colo	29	30	27	26½	2,000
PROSPECTS:					
Argonaut, Colo	22½	†26	22½	24b	25,000
Aspen United, Colo	9	9	8½	8½b	2,100
Big Indian, Colo	10	*11½	10	10¾b	2,000
Big Six, Colo	9b	*11	9¾	9½b	8,100
Claudia J., Colo	08¾b	*11	09	09¾b	9,800
Nat. G. & Oil Co	28b	*29	28	28¼b	5,400
Diamond B., Colo	05¾b	*09	07	06½b	9,800
Emmons, Colo	20½b	*21	18b	18½b	100
Golden Treasure, Colo	17b	17½	16½	16½b	400
Ironclad, Colo	23½b	*26½	23½	23½b	5,300
John Jay, Colo	14	*15	14	13½b	1,300
Justice	15b	*15½b	12b	14b	.....
Legal Tender, Colo	05b	*06	05	05b	8,100
Morning Glim, Colo	48b	48b	45b	45b	.....
Park Consolidated	20¼b	*21½	20½	20½b	300
Potosi, Colo	15b	*16	14	14b	3,800
Rialto, Colo	63	63	60	59b	6,500
Total for the week					196,800

*Buyer 30 days. †Buyer 60 days. a Asked. b Bid.

Minneapolis. July 22.

Company.	Bid.	Asked.
Algoma	.30	$1.00
Aurora I. M. Co	7.50	....
Badger Silver Mg. Co	5.00	10.00
Black Hills Tin M. Co	....	1.50
Canada G. Mg. Co	.20	.50
Carbonate Hill Mg. Co	.50	1.00
Clingstone I. Mg. Co	....	....
Crescent I. Mg. Co	....	1.00
Deer Lodge Mg. & Sm. Co	....	....
Derwood Con. Mg. & M. Co	....	....
Dot Iron Mg. Co	....	....
El Dorado I. Mg. Co	....	1.00
Fairview S. Mg. Co	....	.50
Glengary S. Mg. Co., Mont	....	....
Gogebic Iron Co	....	....
Iron Duke Mg. Co	....	....
Kakabeka Mg. Co	.25	1.00
Keystone Mg. Co	.20	1.00
La Belle I. Mg. Co	1.00	1.50
Marquette Iron Synd.	....	3.50
Minnehaha M. Co	....	2.00
North Pabst I. Mg. Co	....	....
N. W. Coal Mg. Co	3.25	3.75
Stengle L. & M. Co	1.00	1.50
Thunder Bay G. & S. M. Co	.70	1.00
White Spar Mica Mg. Co	1.80	2.00

Salt Lake City. July 19.

Company.	Opening.	Highest.	Lowest.	Closing.	Sales.
Alice, Mont	2.50 b	2.60 b	2.50 b	2.60 b	.....
Anchor, Utah	4.50 a	4.50 a	4.50 a	4.50 a	.....
Alliance, Utah	2.00 b	2.10 a	1.95 b	1.95 b	.....
Apex, Utah	.19 b	.20 b	.19 b	.20 b	5,000
Barnes, Utah	.14½ b	.20 b	.14½ b	.19½ b	14,000
Crescent, Utah	.32½ b	.33 b	.32½ b	.33 b	1,800
Cent.-Eureka, Ut.	21.00 b	23.00 b	21.00 b	23.00 b	200
Daly, Utah	22.00 b	22.35 a	22.00 b	22.00 b	.....
Glencoe, Utah	1.25 b	1.35 a	1.25 b	1.25 b	.....
Horn Silver, Utah	.....	.....	.....	.....	.....
King of West, Id.	60 a	.60 a	.50 a	.50 a	.....
Mammoth, Utah	4.35 b	4.40 b	4.35 b	4.40 b	.....
Malad Con., Id	.05 b	.08 a	.05 b	.05 b	.....
Northern Spy	.....	.....	.....	.....	.....
Ontario, Utah	.....	.....	.....	.....	.....
Utah L. & C. Co.	7.80 b	8.50 b	7.80 b	8.50 b	500
Utah Oil Co., Utah	.25 b	.25 b	.24 b	.25 b	10,000
Woodside, Utah	.....	.....	.....	.....	.....
Total					32,000

* Buyer, 30 days, † Seller, 30 days. a Asked. b Bid.

Lake Superior Iron and Gold Stocks.

(Special Report by David M. Ford, Houghton, Mich.

IRON MINING STOCKS.

Name of company.	Par value.	Bid.	Asked.
Ashland Iron Co	$25.00	$55.00	$58.00
Aurora Iron Co	25 00	8.00	8.50
Champion Iron Co	25 00	....	90.00
Chandler Iron Co	25.00	38.00	40.00
Chapin Iron Mining Co	25.00	30.00	33.00
Chicago & Minn. Ore Co	100.00	115.00	118 00
Cleveland Iron Co	25.00	18.00	18.50
Germania	25.00	11.50	12.00
Jackson Iron Co	25.00	110.00	....
Lake Superior Iron Co	25.00	70.00	75.00
Milwaukee Iron Co	25.00	5.50	6.50
Minnesota Iron Co	100.00	84.00	86.00
Montreal Iron Co	25.00	8.00	9.00
Norrie (Metropolitan)	25.00	75.00	68.00
Odanah Iron Co	25.00	*16.50	22.00
Pittsburg Lake Angeline Co.	25.00	175.00	180.00
Republic Iron Co	25.00	42.50	43.50

GOLD MINING STOCKS.

Name of Company.	Par value.	Lowest.	High.
Gold Lake Mg. Co	....	....	....
Grayling Gold & Silver Co	$25.00	....	....
Michigan Gold Co	25.00	$1.25	1.50
Peninsula Gold & Silver Co	25.00	.50	....
Ropes Gold & Silver Co	25.00	2.25	2.50

* Actual sales were made at these prices.

Kansas City. July 21.

Company.	Opening.	H.	L.	Closing.	Sales.
Argonaut	20†	25½*	20	23½	1,600
Bates-Hunter	43½†	45½*	43½	43½	5,800
Big Six	10†	....	....	....	.....
Brownlow	30†	....	....	....	.....
Cash Gold	39	41*	39	39	2,800
Clay County	43½*	43½*	40	40	1,200
Diamond B	5¼†	6¼	6	6	500
Hard Money	5†	....	....	....	.....
Hunki Dori	15	16*	13¾	13¾	1,100
Iron Clad	24*	24*	22	22	1,100
King Jack	75‡	....	....	....	.....
Little Nugget	52½	55*	52½	53½	1,100
Little Rule	60½	63*	59	59	1,900
May Mazeppa	74	80‖	73½	74	7,000
Minnequa Zinc M. Co	30	33½*	30	31	4,800
Monte Cristo	10	10	8	8	200
Morning Glim	48	50*	47½	48	1,300
Pay Rock	6†	11‖	6†	11‖	.....
Pelican	20½	22½*	20½	20	2,300
Potosi	13†	..	..	..	.....
Running Lode	19	19	18†	18†	100
Sylph	18½*	18½*	18½*	..	900
Total					33,700
Pit sales					

†Bid. ‡Asked. * Buyer 30. § Seller 30. §* Seller 60 ‖ Buyer 60.

St. Louis. July 23.

(From our Special Correspondent.)

The market here continues active, but, as last week, a few stocks monopolize all trading. American and Nettie, Central Silver, La Union, Pat Murphy and Richmond Hill are the leaders this week, their aggregate of sales equaling two-thirds of the total trading.

The silver bill continues to "boom" Bi-metallic, holding it at $32.50, with the stock in good demand.

Wire Patch surprised the market by 1,000 shares selling at 16¼c., and more was bid for at the same price.

The average assay of the recent strike of the Cleveland, of Col., ran 26 ounces of silver, 6·10 ounces of gold and 50 per cent. of lead. This encouraging report had the effect of sending the market up a little.

Montrose placer had a quiet demand at 40c.

The latest news from the Nellie is that of the 13th inst. The report says that all the water is out of the mine; that the machinery is in good shape, and that the work would be started on the following day. There is a good supply of ore on hand to supply the 40-stamp mill.

A private sale of 120 shares Granite Mountain at $46.50@46.75 is reported. The shipments for the week from the mine have been received and amount to 48 bars, containing 71,700 ounces of silver and 147 ounces of gold.

Manager Miller, of the Tourtelotte, has resigned, and Mr. Louis Helm, who is at present at the mine, has appointed a local man superintendent temporarily.

C. W. Prange, of the Yuma, telegraphs that Mr. Heerdegen has located three wells, any one of which can supply water enough to run the smelter. It will be remembered that Mr. Heerdegen is the gentleman who started from here recently for the mine to locate water by his electrical device.

The Gold King Company has been reorganized as the Gold King Consolidated Mining Company. It has a capital of $6,000,000, of which $1,000,000 has been issued for the purchase of the property. The officers are: Jas. Campbell, president, and Jos. Gorman, George Leighton, James Campbell, J. G. Kelly and T. L. Nunn. As soon as the necessary changes in the plant are made active work in the mine will commence. The change referred to is the substitution of electricity for steam in running the quartz mill. The proposed change will involve a total expenditure of $87,160. An agent is now East selecting the necessary machinery. The new stock will be sold to the old stockholders equal to the amount of their old holding at a price

sufficient to clear the debt of $102,000. This offer is open for sixty days.

Prices and sales for the week ending July 23d, 1890, are:

Company.	Opening.	H.	L.	Closing.	Sales.
Adams, Colo.	$1.00	....	....	1.10	.....
American & Nettie.	1.95	1.97½	1.85	1.85	$3,150
Aztec	.07	....	....	.07½	.....
Bi-Metallic	32.50	32.50	31.50	32.50	10
Buckskin	.05½	....	....	.05	.....
Cœur d'Alene	.90	....	....	.87½	.....
Central Silver	.14¼	.15	.12	.13½	19,200
Cleveland, Colo.	.05½	.04½	.03	.04½	.....
Cleveland, Idaho.	.15	.16¼	.15	.15	.....
Elizabeth	2 12½	....	....	2.10	1,000
Granite Mountain	46.50	46.75	....	46.50	.....
Hope	2.05	....	....	2.00	.....
I. X. L.	.02	....	....	.01½	400
Ingram	.30	.40	.25	.25	.....
La Union	.10	.10	.08½	.09	4,500
Little Albert	.35	.35	.30	.31¼	800
Mickey Breen	1.30	1.32½	1.20	1.20	800
Major Budd	.06½	....	.06	.06½	.....
Mountain Key	.26¼	....	....	.65	.....
Montrose Placer	.38¾	....	....	.40	1,000
Pat Murphy	.14	....	....	.11½	5,800
Richmond Hill	.10½	.10	.12½	.12	2,800
Small Hopes	.87½	....		.85	.....
Silver Age	1.52½	1.55	1.50	1.50	300
Tourtelotte	.03½	.04	.03	.04	1,800
Wire Patch	.15	..	....	.16¼	.....
Yuma	.42½	.43¾	....	.40	.....
Total					43,560

PIPE LINE CERTIFICATES.

[Specially reported by Messrs. Watson & Gibson].

The conference of oil exchanges which was held in this city Monday has settled the matter of listing the certificates of the Buckeye Pipe Line Company by an agreement with the officers of the company, and when the action of the conference has been ratified by the various exchanges, the trading in these certificates will be commenced. This is the most important movement which has been made in the oil trade in a number of years, and will, without doubt, lead to a revival of business in the various oil exchanges, and perhaps to the organization of new ones at some of the important cities in Ohio.

There is now above ground about 20,000,000 barrels of Ohio oil, and the field is a prolific one and capable of great extension. The country in which the field is located is a rich one, and, as history generally repeats itself, a large speculation may be looked for once the business is fairly in motion. The present price for the oil is about 40 cents per barrel.

A Pittsburgh writer, in speaking of the oil trade, says:

"Pittsburg is long of oil, and the oil country is believed to be short, and traders here think the evening-up process at the end of the month will be more interesting than usual. What will become of the 3,000,000 outstanding National Transit certificates in the event that public speculation in them ceases upon the advent of Ohio oil on the exchanges? is a question now agitating the trade. One member suggested that the Standard might fix a price at which it would retire them, and as it is the largest holder, the number to be bought in would be trifling. The prospect of a revival of speculation, even though it be in the much despised Lima oil, has put the traders into a good humor with themselves and everybody else."

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
July 19	90½	90½	90	90	10,000
21	89½	89¾	89½	89½	59,000
22	89⅞	89⅞	89	89	23,000
23	89	89	89	89	11,000
24	89	89	88½	88¼	34,000
25	88½	89	88½	88⅞	36.000
Total sales in barrels					173,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
July 19	90	90½	89⅞	90	22,000
21	89¾	90	89½	89½	43,000
22	88¾	89⅞	89⅝	89½	60,000
23	89	89⅝	89	89½	40,000
24	89	89	88¾	89	48,000
25	89	89¼	87⅞	89⅛	32,000
Total sales in barrels					245,000

COAL TRADE REVIEW.

Statistics.

NEW YORK, Friday Evening, July 25.

Mr. John H. Jones, chief of the Bureau of Anthracite Coal Statistics, furnishes us the following statement of shipments of anthracite coal (approximated) for the week ending July 19th, 1890, compared with the same period last year:

Regions.	July 19, 1890.	July 20, 1889.	Difference.
Wyoming Region. Tons	430,187	440,370	Dec. 10,183
Lehigh Region ... "	132,032	148,638	Dec. 16,606
Schuylkill Region. "	255,265	261,894	Dec. 6,629
Total	817,484	850.902	Dec. 33,418
Total for year to date	17,397,515	17,441,479	Dec. 43,934

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending July 19th, and year from January 1st, in tons of 2,000 lbs.: Week, 98,038 tons; year, 2,955,732 tons; to corresponding date in 1889, 2,420,860.

PRODUCTION OF BITUMINOUS COAL for week ending July 19th and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1890. Week.	1890. Year.	1889. Year.
Phila. & Erie R.R.	2,053	72,013	36,331
Cumberland, Md.	75,075	1,993,908	1,638,550
Barclay, Pa.	*3,247	80,589	63,003
Broad Top, Pa.	9,617	281,481	163,834
Clearfield, Pa.	62,926	2,110,968	1,617,637
Allegheny, Pa.	20,830	724,652	418,339
Beach Creek, Pa.	‡32,355	1,019,320	765,185
Pocahontas Flat Top	39,032	1,042,476	942,684
Kanawha, W. Va.	†38,618	1,124,718	940,617
Total	283,813	8,450,125	6,586,180

* Estimated.
† For week ending July 14.
‡ For week ending July 22.

WESTERN SHIPMENTS.

Pittsburgh, Pa.	12,696	478,349	320,101
Westmoreland, Pa.	15,137	746,753	758,332
Monongahela, Pa.	16,351	246,343	172,334
Total	44,184	1,471,445	1,250,767
Grand Total	327,997	9,921,570	7,836,947

Anthracite.

The sales agents will meet on Tuesday, not to raise the prices for August, nor, is it believed, to raise the output to any higher figures than those for July, but to compare notes about the output for the latter part of the current month. It is certain that stocks are large, and it is generally believed in the trade that though the output agreed upon for the month has since been reduced by 250,000 tons, overproduction is going on, and more coal is being mined than is justified, considering the dullness of the season.

Though there is no sign yet of any revival, there is a feeling of confidence that August will show a material improvement over July, if July prices are maintained. The figures for August since 1886 show that that month has invariably compared well with other months in the year.

The cutting in prices in Brooklyn is only an insignificant local squabble between dealers, and will have no effect on this market. Dull as trade is, it would be a difficult matter to buy any large quantity of hard coal at a price appreciably below figures agreed upon by the sales agents.

Prices remain the same as last week, with a little more doing under the July schedule. Most of the business done is yet at the June rates.

The companies' list prices f.o.b., for July, remain: New York harbor for free-burning coals: Stove, $4; egg, $3.75; broken and chestnut, $3.65; pea, clear free-burning, $2.50 f. o. b.; other grades, 10 cents to 30 cents less; buckwheat, $1.60 to $1.80 f. o. b.

Bituminous.

A large tonnage in soft coal is going forward, but it is nearly all on old contracts. The market could take more than present car facilities permit. Boats, however, are plentiful, and freights weak, having declined to 80 cents from Philadelphia to Boston, and 90 cents to Providence.

The entire absence of buying and selling on speculation which has characterized the present season is due to the increased prevalence of the contract system, which gives satisfaction to both miner and consumer. Nearly all the large consumers of soft coal have closed contracts for their supply for the season at prevailing prices, which are high enough to impart a good tone to the market.

The settled feeling induced by so large a part of the output being contracted for supports the market, and promises to keep it in its present satisfactory condition. Despite the local labor troubles, there is not yet any scarcity from this cause, and there is enough coal mined to supply the demand of the immediate future if carrying facilities can be obtained. Prices remain: Baltimore, $2.40@$2.50 f. o. b.; Philadelphia, $2.50@2.60; in New York harbor, $3.25; alongside, $3.50.

Boston. July 24.

[From Our Special Correspondent.]

It does not often happen at any season of the year that one week is so much like another in the coal trade as now. There is no new business in the anthracite branch of the market. Those jobbers who were anticipating something of a movement at this time are for the most part disappointed. The output at retail is moderate, and then the weakness of the wholesale market inclines retailers to wait. They are willing to buy a little coal now where they would not talk trade a fortnight ago in many cases; but only now and then is a dealer found who is willing to pay anything like asking prices. They want to take on coal at the same price as that of their purchases at the opening of the season, and this cannot be done at present, although some individual coal is offered at figures pretty close to the lowest. Those who do buy take on small lots only. Wholesalers do not seem exercised over the situation, and think if the companies can stand another month of dullness, and will curtail production a little more vigorously in the few weeks ahead, that there will be no break or demoralization. Stove coal can be had at about $3,65@$3.75 f.o.b. at New York. Broken and egg sizes range from $3.50@$3.70, and are not so plenty as stove.

The bituminous market is without marked feature. Receipts at this port by water are not quite as large as at this time last year but the difference is not marked. I think that if there was any possibility of computing the amount of bituminous coal brought into New England by all-rail routes that the result would show fully as large receipts as a year ago. The increased shipments all-rail are not marked but the increase is a steady one.

The consumption of bituminous coal is likely to be larger than usual this summer, because of the absence of rains in this section since July 1st. Many mills along the Merrimac River, also at Holyoke, are being troubled a good deal for want of water. In not a few cases where water power was the sole dependence mills have had to shut down within a few days or only run a few hours each day. The water at Lowell is very low, and at Nashua the cotton mills are put to no little convenience. At Manchester the mills are better supplied with steam power than at Nashua, and both at Manchester and Lowell steam coal consumption has been increased materially. The demand for steam coal has not been affected by these developments to any extent, but later on contracts already made will have to be stretched out in many cases. There is a very fair demand for cargo lots, at say from $2.25 to $2.40 f.o.b.

Freights remain about the same. The weather is so fine that vessels are making quick trips, and captains are not inclined to be quite so stiff in their demands as they have been. Still rates are nominally unchanged, quoting 65@75c. from New York ports, 90@95c. from Philadelphia and $1.10@$1.20 from Baltimore. There is still some detention in loading at some ports.

Retail trade is inactive. Prices remain unchanged.

Buffalo. July 24.

[From Our Special Correspondent.]

There was but little trading done in anthracite coal the past week; prices unchanged; features of interest scarcely worth noting, except to show that our city still exists. The reduction of a quarter of a million in the quantity of coal to be mined this month is not deemed to be of any consequence, and has had no effect upon the market; the concession came too late.

Bituminous coal quiet and prices firm, with indications of an advance in the near future. It is rumored that some steps may be taken to form a combination to fix quotations at figures that will ensure no loss to miners, shippers and dealers generally. Selling at cost or less than cost is not a paying business to be engaged in.

The squabble over the awarding of the contract for anthracite coal for the Poor Department of the city culminated yesterday; the passage of a resolution ordering that proposals be readvertised for, was adopted, and an alderman asserted that at least 50c. per net ton would be saved by so doing. The newspapers have reaped quite a harvest of news by the controversy, and many hard words have passed among members of the Coal Exchange and others.

The police made a raid last week upon a gang of Poles who were carrying off bags of coal from the New York Central yards at East Buffalo and captured 14 of them. The police justice, upon their pleading guilty to a charge of petit larceny, fined them $5 each.

There is little doubt that the Buffalo Natural Gas Fuel Company will purchase the wells of the Provincial Natural Gas and Fuel Company of Canada, and enlarge their sphere of operations in this city. Particulars of the valuable gas territory controlled by the company named have already been published in the ENGINEERING AND MINING JOURNAL.

Lake freights on coal quiet and unchanged, with vessel men firm in their views; tonnage not plentiful. The shipments of coal from this port from July 17 to 23, both days inclusive, aggregated 49,580 tons, namely, 24,800 to Chicago, 11,050 to Milwaukee, 1,500 to Duluth, 5,800 to Superior; 200 to Bay City, 1,600 to Marquette, 1,300 to Hancock, 660 to Detroit, 700 to Gladstone, 640 to Sault Ste. Marie and 1,440 to Port Burwell; total thus far this season, 763,390 net tons. The rates of freight were 60c. to Chicago and Racine, 50c. to Portage and Milwaukee; 40c. to Duluth, Superior, Marquette and P. Clan; 30c. to Detroit and Toledo; 50c. to Hancock and Sault Ste. Marie; 40c. to Gladstone and 25c. to Bay City. Coal receipts by canal third week in July, 1,060 net tons; shipments, 241 net tons.

Coal canal boats wanted; freight reported only two loads, one to Syracuse at 60c., and one to Lockport at 35c. per net ton, free on and off.

Chicago. July 23.

(From our Special Correspondent.)

As to the Chicago coal market we can only report a fair summer business, unchanged (as yet) prices, with a good look for business to come. It is evident that a large tonnage has changed hands at prices prior to the late advance, which seems to have become very unpopular, and by the knowing ones said to have been made unwisely, else a freer movement of coal would have been the result at the time of the present writing.

We continue to quote retail prices large egg $5.75, small egg, range and chestnut, $6.

On cars, f. o. b., Chicago grate $5, stove, range and chestnut $5.25.

The figures for bituminous remain firm and unchanged also.

They are, per ton of 2,000 pounds: Green and Sullivan County (Ind.), shaft, $2.25@$2.40; Jackson Hill, $3.25; Hocking Valley, $3; Ohio Central, $3; Erie, Briar Hill, $4.15@$4.20; Indiana Block, $2.35; Youghiogheny, $3.35; Sunday Creek, $3; Connellsville, $5.20.

Pittsburg. July 24.

[From our Special Correspondent.]

Coal.—The season for activity is over for the present. Navigation to the lower ports continues suspended; miners are scarce. In the first pool on the Monongahela only one is in operation; in second pool, four; third pool, four, and fourth pool, twelve; total, 12 mines. July, last year, there were 81 mines working.

Nominal rates in pools:

	Per 100 bushels.		Per 100 bushels
1st pool	$4.75	3d pool	$3.90
2d pool	4.50	4th pool	3.25

Railroad coal, $5.00@$5.50.

Connellsville Coke.—Trade may be termed active for the season. Shipments are on the increase, exceeding the preceding week 600 cars; this for July is something very unusual. Increase to the West, 400 cars; Pittsburg, decrease, 100 cars; Eastern shipments, increase, 300 cars. The car supply was good. The current rates for 2,000 pounds f.o.b. cars at ovens are:

Blast furnace coke, $2.15; foundry coke, $2.45; crushed coke, $2.65.

Freights to Pittsburg, 70c. per ton; Mahoning and Shenango Valleys, $1.35; St. Louis, $3.30; Cleveland, $1.70; Chicago, $2.75.

FREIGHTS.

From Baltimore to: Bangor, 1.10; Bath, 1.10; Boston, Mass., 1.10; Charleston, .75; Fall River, 1.10@1.15; Galveston, 3.40; New Bedford, 1.05; New Haven, 1.05; New London, 1.05; New York, N. Y., 1.05; Portland, 1.10; Portsmouth, N. H., 1.10; Providence, 1.05; Salem, Mass., 1.10; Savannah, .80; Williamsburg, N. Y., 1.10.

*And discharging. †Alongside. ‡And towage. §Flat.

METAL MARKET.

NEW YORK, Friday Evening, July 25th.

Prices of silver per ounce troy.

July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
19	4.88¼	50	1.08⅞	23	4.88¼	50	1.09¼
21	4.88¼	50¼	1.09⅛	24	4.88¼	49⅞	1.09⅛
22	4.88¼	50⅛	1.09⅛	25	4.88¼	49¾	1.08¾

Council bills declined ¼d. on Wednesday's allotment.

Prices of silver bars has steadily fallen in London owing to shipments of some one and a quarter million ounces to that market this week. As our government is not buying at present the tendency has been downward here.

The United States Assay office at New York report total receipts of silver for the week to be 80,000 ounces.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
July 19	109⅝	108¾	375,000
July 21	110	109¾	855,000
July 22	109⅞	109¾	155,000
July 23	109⅞	109⅝	410,000
July 24	109¾	109⅝	155,000
July 25	109⅝	109	135,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

July 19	109½	....	10,000
July 21	109¾	....	10.000
July 22	109¾	....	5,000
July 25	109¼	....	10,000
Total sales			2,120,000

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked
Trade dollars	$ .83	$ 85
Mexican dollars	.85	.86
Peruvian soles and Chilian pesos	.75½	.76½
English silver	4.86	4.90
Five francs	.94	.95
Victoria sovereigns	4.90	4.93
Twenty francs	3.86	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.08¾	1.09¾

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its rate for discount, and it remains at 4 per cent. During the week the bank gained £335,000 bullion, and the proportion of its reserve to its liabilities was raised from 34·87 to 38·90 per cent., against a decline from 38·03 to 37·78 per cent. in the same week of last year, when its rate for discount was 2½ per cent. On the 25th inst. the bank gained £38,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 4,800,000 francs gold and a gain of 575,000 francs silver.

Copper.—There is not the slightest indication of any weakening of the strong tone which has now characterized the whole copper market for a considerable time past. On the contrary values continue to harden as a natural consequence of a large and increasing demand. This is particularly the case in regard to Lake brands, and the market is now practically cleared of all offerings of same @17c., at which figure large orders have been placed, and many buyers are still bidding that price. Arizona copper is now firmly held for 15¾@16c., but casting sorts are comparatively quiet and neglected at 14⅞@15c., although the consumptive demand for all sorts is exceedingly heavy, and the smelters of casting sorts are understood to be greatly pressed to keep up with their customers' orders.

The European market has been a little disappointing during the past week, and although the London market for Chili bars and G. M. B. copper opened stronger on Monday morning at £57 12s. 6d.@£57 15s. spot and £58 5s.@£58 7s. 6d., 3 months and afterward went up a little higher still, it has since eased off somewhat again and the closing quotations received by cable to-day, viz.: £57 12s. 6d.@£57 15s. spot and £58@£58 5s., 3 months show only a slight advance on last week's figures. At the same time, 2,000 tons of Anaconda Matte have been on offer in Europe at 11s. 3d. which is a remarkably low price for this material. Other wise the tendency continues very good and the latest quotations for refined and manufactured sorts are as follows: Best selected, £65@$65 10s.; strong sheets, £70; India sheets, £65; English tough, £62@£63; yellow metal. 6¼d.@6½d.

The exports of copper during the past week were as follows:

To Liverpool—	Copp. Matte.	Lbs.	
S. S. The Queen	1,885 bags.	263,743	$20,000
To Hamburg—	Copper.	Libs.	
S. S. Columbia	31 pkgs. bars.	1,845	200
	Old copper.		
S. S. California	34	47,449	4,600

Tin.—In sympathy with London, where prices have been gradually declining from day to day, our market here has been rather weak, and although orders from consumers have again been coming in more freely prices have given way somewhat and business has been done at 21c. and even down to 20·90. We close to-day with a quiet feeling, with sellers at about 21c. spot and 21⅛c. futures.

As before stated the London market has been falling from day to day. After closing last week at £95 2s. 6d., spot, and £95 15s., futures, it opened on Monday morning at £94 5s.@£94 7s. 6d, spot, and £94 15s.@94 17s. 6d., three months, whilst the closing quotations received by cable to-day are £93 15s.@93 17s. 6d., spot, and £94 5s.@£94 10s., three months, or a decline of nearly of £1 10s. per ton for the week.

Lead is still a evry inactive market. During the week a few retail lots have been sold @4.50 but larger lots might probably have been bought at a trifle under that figure. We dont anticipate any important decline as buyers are eagerly waiting for a chance to get in cheaper and sellers evince no disposition to make concessions. The closing quotations are 4.45 to 4.50.

The St. Louis Lead Market.—Messrs. John Wabl & Co. telegraph us as follows: "Lead is in moderately steady demand, slightly on the increase, and transactions are rather liberal considering the usual midsummer dullness. There were probably 700 tons sold in retail lots at from $4.32½ to $4.35. The advance in silver appears to stimulate silver ore production, and while lead appears to have many friends we scarcely look for much, if any, further advance."

The Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "Lead is weaker, and the pressure to sell at this centre has reduced quotations to 4⅜c. nominally, but consumers are apathetic and the bid price at the close is 4·30c.

Spelter has been in very good demand at about 5.50 to 5.55.

Antimony remains exceedingly steady, and we have to quote Cookson's at 23½@24, LX. 21¾@22, and Halletts 20¾@21.

In London the market is strong, Cookson's ask £77 to £78, while Hallett is sold out for some time to come.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 25.

The situation in the iron trade remains unchanged from last week's reports. There is no movement perceptible in any branch, excepting, perhaps, in structural iron, which is brisk, owing to extensive building going on. Compared with the dull season of last year, the middle of July, this year, makes a good showing. Prices are nearly $1 a ton higher all round, and stocks are in a very healthy condition, with the present and prospective demand for consumption continually increasing. The official report shows that, with warrant iron included, the amount in hand is only 403,450 gross tons, or about three weeks' supply. Though no business is doing, the market remains firm, and prices, generally, are quoted as the same as last week.

American Pig Iron.—Though little actual business is being transacted, the trade in American pig iron is confident and firm, and the outlook for fall trade very encouraging. Stocks are low, demand is increasing, and the tendency of price is upward. Several attempts have been made during the week to capture some bargains, but holders have declined to shade prices, so far as we hear, and bargain hunters go away disappointed. We quote: Southern No. 1, $17.25@$18; No. 2, $16.50@$17; Northern, No. 1, $18@$18.50; No. 2 $17@$17.50.

The American Iron and Steel Association reports that the quantity of all kinds of pig iron held for sale by the manufacturers or their agents on June 30 amounted to 380,744 net tons, or 339,950 gross tons, which is an increase since January 1 of 92,271 gross tons. Compared with the unsold stocks held a year ago, however, the quantity reported on June 30 has decreased 162,984 gross tons. In addition to the quantity of pig iron held by the makers or their agents on June 30, the American Pig-Iron Storage Warrant Company reports 63,500 gross tons stored in its warrant yards on that date, which, added to the 339,950 gross tons in first hands, makes a total of 403,458 tons of unsold pig-iron, which is less than a three weeks' supply at the present rate of consumption in this country.

Classified according to the fuel used in the manufacture of pig-iron, the quantity held in first hands on June 30 was divided as follows: Anthracite and coke pig-iron, 74,250 gross tons; coke and bituminous coal pig-iron, 175,531 tons; charcoal pig-iron, 90,169 tons.

Scotch Pig Iron.—No transactions during the week have been heard of which would make a quotable price. The figures stated last week rule this week, with sellers offering no concessions to secure business. No. 1 Coltness, $23.50; Dalmellington, $20.50; Eglinton, $19.25.

Spiegeleisen and Ferro-manganese.—No business doing at all, and prices may be quoted nominally as: Twenty per cent. spiegeleisen remains at $30.50@$31 and 80 per cent. ferro at $77@$78.

Steel Rails.—Except on old contracts, the movement in steel rails is in thorough sympathy with the rest of the market, and nothing is doing. Prices are firm at $31.25@$31.75, the latter figure having been paid for several small lots this week.

Rail Fastenings.—Trade is as dull as it can be, but last week's prices quoted are firmly demanded: Spikes, 2c.; angle plates, 1·85@1·90c.; bolts and square nuts, 2·70c., and hex. nuts, 2·95c.; complete joint, steel and iron, according to weight.

Structural Iron and Steel.—An advance was expected this week, but has not materialized. Nevertheless, business is good, and the mills are most of them running on full time to keep up with the demand. Prices are: Universal plates, 2·20@2·28c.; bridge plates, 2·15@2·20c.; angles, 2·10@2·15c.; tees, 2.65c.; beams, 3·10c.

Tubes and Pipes.—Manufacturers claim that they have got all the business they care to take at this season of the year, though the general dullness has had its effect. Very little new business is heard of, and prices may be quoted as follows: For tool steel, $7.75@$8; specials, $12@$25; open hearth machinery, $2.75; Bessemer machinery, $2.50@$2.60; open hearth spring, $2.60@$2.65; tire, $2.50@$2.60; toe calk, $2.70@$2.80; crucible sheet, $7@$10; crucible spring, $3.75.

Merchant Steel.—Most of the mills have shut down for stocktaking and repairs, and little, if anything, is doing. Prices may be quoted as nominally: Best English tool steel, 15c. net; American tool steel, 7½@10c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2¾c.; open-hearth spring, 2¾c.; tire steel, 2¾c.; toe calks, 2¾c.; flat file, 4¾c.; mill file, 5¼c.; taper file, 7¼c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—There is plenty of demand, but no supply. The market could take a good many tons, but no one seems to have any. The demand comes freely from the West. Buyers offer $24, and perhaps 25 cents more, but sellers demand $24.50 to $25.

Chicago. July 23.

(From our Special Correspondent.)

During the past week prices for pig iron in the Chicago market have been well sustained as to Northern and Southern brands, although some small concessions may be noted in the latter; all furnaces are very firm in their views.

No change in prices has taken place in Lake Superior charcoal irons, and many large orders have been placed during the past week.

Furnaces are well sold up and are not urging their product for future delivery.

Coke irons are in good demand, and held very closely to quoted figures.

Missouri charcoal is again coming to the front and selling freely in this market.

We quote to-day for cash per ton of 2,240 lbs. f. o. b. Chicago: for Nos. 1 and 2, Lake Superior

charcoal, No. 3, for car wheels, Nos. 4 and 5, for malleable, $20.50@$21; Lake Superior coke Bessemer, $18; Lake Superior coke Bay View No. 1, $17; No. 2, $16; No. 3, $16. Southern coke No. 1, $16.50@$17; No. 2, $15.50@$16; No. 3, $15@15.50.

Southern charcoal, $19@$19.50; standard Southern car wheel, $24@$25; Ohio softeners, Hanging Rock, $18.50@$19; Jackson County, $18@$19; Hanging Rock cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $25@$26; American Scotch, $19@$20; Bay View Scotch No. 1, $17; No. 2, $16; Chicago Scotch No. 1, $17; No. 2, $16; Emma Scotch, $19@$19.50; Black band, Hubbard Scotch, $19.50; Haselton, $20.25; soft Silvery, $18; Wellston No. 1, $19; No. 2, $18.50@$19; Hamilton No. 1, $18; Norton No. 1, $18@$18.50; Zanesville No. 1, $18.

Bar Iron.—The regular market quotation is now $1.90, Chicago, but many mills are running $1.80@$1.85 as the best they will do. Most of the mills are well sold up into August, and some into September, and some can give immediate delivery; these indications point to a bull market. Dealers have paid $1.85 for iron, and the store price is now $2, and very firm at that. Valley mills quote $1.70 f. o. b. Youngstown.

Black Sheet Iron.—In good demand and firm. Quotation are $3@$3.10 f. o. b. mill for No. 27: Store prices are $3.40@$3.50 for No. 27, $3.30@3.40 for Nos. 25 and 26 and $3.20@$3.30 for No. 24.

Galvanized Sheet Iron.—The demand is fair and prices firmly maintained. Mills are behind with deliveries and stocks held are broken. Discounts for both cheap and standard brands are now 62½ per cent. on Juniatta and 62½ and 5 per cent. on charcoal from store. Jobbing lots are quoted according to quantities.

Merchant Steel.—We note a very satisfactory demand and orders aggregating a satisfactory volume of business. Prices are unchanged. Tool steel, $7.75@$8; specials, $12@25; open hearth machinery, $2.75; Bessemer machinery, $2.50@$2.60; open hearth spring, $2.60@2.65; tire, $2.50@$2.60; toe calk, $1.70@$2.80; crucible sheet, $7@$10; crucible spring, 23.75.

Car lots are: tire steel, $2.20; toe calk, $2.40@$2.50; Bessemer bars, $2.25@$2.30; machinery, $2.60@$2.80 f. o. b. Chicago, 60 days.

Plates, Tubes, etc.—The expected advance in prices has as yet not put in any appearance; former figures are adhered to very firmly. We quote as follows: tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25@$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50; shell steel, $3.25; boiler rivets, $4@$4.25; fire box iron and steel, $4.75@$5.50; boiler tubes 4½ inches and larger 52½ per cent., 2 to 4 inches 50 per cent., and 1¼ inches and smaller 45 per cent.

Structural Iron.—A good inquiry and fair business exists, supported by the heavy local and outside consumption of building irons; prices remain unchanged. We quote: angles, iron and steel, $2.30@$2.40; universal plates, $2.50; sheared plates, $2.50; tees $2.60@$2.70; beams and channels $3.20. Store prices are: angles $2.50@$2.60; tees $2.80; beams and channels $3.70.

Nails.—The Valley and Wheeling factories have plenty of orders and $1.90 is the bottom figure. Wire nails are unchanged at $2 25, subject to the usual discount.

Scrap Iron.—The idleness of mills and furnaces causes only a limited demand for first-class material. Prices are unchanged. We quote: country mixed scrap, $13.50@$14, according to condition; No. 1 mill, $14@$14.50; light wrought, $9.50, horse shoes, $19.50@$20; axles, $23; cast machinery, $12.50@$13; stove plates, $9.50@$10; borings, $8.50@$8.75; wrought turnings, $11.50@$12; No. 1 railroad shop or forge, $19.50@$20; track scrap, $19.50.

Sheet and bolt copper 25c. pound rates. Sheet brass, copper and brass wire, 20 per cent. discount factory delivery.

Louisville. July 22.

(Special report by HALL BROS. & CO.)

A very quiet market has ruled during the week; trading was light and in small quantities. The familiar rule that July and August are dull months is, thus far, not finding an exception in the case of the present year. Reports indicate a further increase of stocks and some furnaces display more anxiety for orders. Some of the leading consumers report a very active demand for their finished products, though this gives no stimulus to the pig iron market, as their requirements are covered for some time into the future.

Hot Blast Foundry Irons.	
Southern Coke No. 1	15.00@ 15.25
" " No. 2	14.25@ 14 50
" " No. 3	14.00@ 14.25
Mahoning Valley, Lake ore mixture	17.75@ 18.75
Southern Charcoal No. 1	17.00@ 17.50
" " No. 2	16.50@ 17.00
Missouri " No. 1	18.00@ 18.50
" " No. 2	17 00@ 17.50
Forge Irons.	
Neutral Coke	13.75@ 14.00
Cold Short	13.75@ 14.00
Mottled	12.75@ 13.25
Car Wheel and Malleable Irons.	
Southern (standard brands)	22.00@ 23.00
" (other brands)	18.00@ 19.00
Lake Superior	22.50@ 23.00

Cleveland. July 25.

(From our Special Correspondent.)

By Telegraph.—There has been a very active movement in Lake Superior iron ore during the past two weeks. Some 300,000 tons have been sold, mostly of new Bessemer. Prices have dropped about 25 cents per ton, as compared with previous quotations.

Philadelphia. July 24.

(From our Special Correspondent.)

Pig Iron.—The recently published statistics of the crude iron trade will, it is thought in iron trade circles, have the effect of stimulating demand. A good deal of the dullness of the past month or six weeks has been due to the theory entertained by some parties that an accumulation of iron is going on which would sooner or later result in a depression of prices. The market is in a very healthy condition, taking into account the extraordinary demand in sight. Quotations are given as usual at $18@18.50 for No. 1, $16.50@$17 for No. 2, and $15.50@$16 for forge. Inferior brands of forge can be had at $15. Bessemer is nominally $19 at furnace; buyers are waiting.

Foreign Material.—Quotations for 20 per cent. spiegel are given to-day at $30.50@$31.

Steel Billets and Slabs.—There are several parties in the market trying the temper of manufacturers; but they are making no headway in their negotiations. A large amount of work will, no doubt, be placed before the close of the month, at $33@$33.50 delivered. Imported billets are quoted at $32.50.

Muck Bars.—Muck bars have moved up a little, and yet very few lots have sold. To-day's delivery quotations are $29.50.

Merchant Iron.—The scale has been signed by nearly all mill owners, but one mill company in the interior is still refusing; the idle mills will resume next Monday. Prices are strong, and store quotations for small lots are as high as 2c. Good iron has sold at mill at as low as 1·80 in large lots.

Sheet Iron.—Large orders at mill for best refined sheets have been placed at 3·20@3·40 for Nos. 21 to 26 gauge. Soft steel sheets range from 3¼@4c., and the demand is good.

Skelp Iron.—Several buyers are in the market for large lots of skelp; quotations, 1·75@2c. respectively, for grooved and sheared. One or two makers who are well sold up are asking a trifle more.

Plate and Tank Iron.—Orders are beginning to accumulate and prices are firm. Ship plates are quoted as low as 2·10 in large lots for iron, and 2·30 for steel. Agents say there will be quite a run for steel plates this fall. Mills will all be running next week with an abundance of orders.

Wrought Iron Pipe.—Discounts are firmly maintained, and there is an abundance of business to keep the mills running full time all season from the present outlook.

Structural Iron.—The mills are full of work and running full time. Brokers and managers give an excellent report of trade prospects. The lowest quotation known this week was 2c. for ordinary plates. Lowest quotation for fire-box, 3·60 for iron. Steel sold as low as 4c., but 4·25 is ordinarily quoted.

Steel Rails.—Orders for light sections are quite numerous. Some little business in heavy sections is coming along. Bottom quotations are given to-day at $31 for standard sections.

Old Rails.—All the old rails that could be offered would find prompt buyers at $25 at tidewater points.

Scrap.—The lowest figure named this week for No. 1 scrap is $21.50. There is not much doing in other kinds.

Pittsburg. July 24.

[From our Special Correspondent.]

Raw Iron and Steel.—The situation presents little that is very new or important. July, with rare exceptions, is generally looked upon as one of the dullest months of the year, being the time for stock taking, general repairs, and scale signing and various other matters; hence, as a general thing business don't show up to the same extent as in other months. As noted in our last, quite a number of furnaces is out of blast, and will so remain, at least, for a short time. The American Iron and Steel Association reports that the quantity of all kinds of pig iron held for sale by the manufacturers, or their agents, June 30th amounted to 339,950 gross tons, which is an increase. Since January 1st of 921,271 tons, compared with the unsold stocks held a year ago, however, the quantity reputed June 30th has decreased 162,984 tons. In addition to the quantity of pig iron held by makers, or their agents, on June 30th, the American Pig Iron Storage Warrant Company reports 63,500 tons stored in its yards on that date, which, added to the 339,950 tons in first hands, makes a total of 403,450 tons of unsold pig-iron, which is less than a three weeks' supply at the present rate of consumption in this country.

In regard to values there is little change to note; while sales have not been large, there has been an increased inquiry for most descriptions, that being the first part of the programme. Sales are expected to follow in the near future. City furnaces, some of them, are holding their iron out of the market, having no fixed price for their product, and will not accept present rates. Others, again, hold different views, and in some instances accept current rates.

For July the outlook is certainly a good one. A big fall trade is predicted by parties whose means of information are good. At the same time no great activity need be expected before the middle of August or the 1st of September.

A leading dealer remarked: "Considering that midsummer is always a dull time in the iron trade, the market is in good condition at the present time. Notwithstanding the demand for pig iron is diminished, in a measure, by the suspension of work in a large number of rolling mills, crude material is still holding its ground, and the slackened business has depressed prices only to a limited extent."

Old iron rails are scarce, holders, as a general thing, being firm in their views, refusing to make concession in order to effect sales. Foundry iron shows an increased enquiry, without any quotable change in values. Muck bar holds its own; offerings not large. Bessemer iron not so firm, sales being made at a slight decline. Grey forge less fancied; steel descriptions hold their own.

Coal and Coke Smelted Lake Ore.	
1,500 Tons Bessemer, August and September	19.50 cash.
1,500 Tons Mill Iron	15.50 cash.
1,000 Tons Grey Forge, September	15.65 cash.
1,000 Tons No. 4 Grey Forge	15.25 cash.
1,000 Tons Bessemer	19.00 cash.
750 Tons Bessemer	19.25 cash.
500 Tons Grey Forge, August	15.50 cash.
700 Tons No. 1 Foundry	17.50 cash.
500 Tons Grey Forge	15.50 cash.
500 Tons White and Mottled	14.75 cash.
Coke Native Ore.	
100 Tons White Iron, Southern	14.50 cash.
50 Tons Silvery	17.50 cash.
50 Tons No. 3 Foundry	16.00 cash.
50 Tons Foundry	17.00 cash.
50 Tons No. 2 Foundry	16.00 cash.
50 Tons Silvery Extra	18 00 cash.
30 Tons No. 1 Foundry at Furnace	17.40 cash.
30 Tons No. 2 Foundry	16.50 cash.
Charcoal.	
100 Tons No. 3 Foundry	23.00 cash.
50 Tons No. 3 Foundry	23.00 cash.
Muck Bar.	
2,000 Tons Neutral	29.25 cash.
1,250 Tons Neutral, August and September	29.75 cash.
500 Tons Neutral	29.00 cash.
500 Tons Neutral, paompt shipment	29.50 cash.
Steel Billets and Slabs.	
1,500 Tons Billets, August and September	31.00 cash.
1,000 Tons Billets, August and September	31.25 cash.
500 Tons Billets, August	31.75 cash.
500 Tons Slabs	31.00 cash.
Skelp Iron.	
2,000 Tons Sheared Iron	202½ 4 mo.
300 Tons Wide Grooved	185 4 mo.
200 Tons Narrow Grooved	175 4 mo.
Steel Wire Rods.	
500 Tons American Fives, August	44.00 cash.
500 Tons American Fives, Sept. and Oct	46.50 cash.
Ferro-Manganese.	
75 Tons 80 per cent., Oct. f.o.b. New York	71.80 cash.
Bloom Ends.	
500 Tons Bloom Ends	21.50 cash.
300 Tons Bloom Ends, Aug.	21.75 cash.
Steel Blooms.	
750 Tons Blooms 9 + 9	31.50 cash.
350 Tons Blooms	31.60 cash.

Prices.

Coke or Bituminous Pig—		20% Spiegel at New York	$31.75
Foundry No. 1	$17.50@17.75	Muck-Bar	29.00@29.50
Foundry No. 2	16.25@16.50	Steel Blooms	31.00@31.50
Gray F. No. 3	15.50@15.75	Steel Slabs	31.00
" No. 4	15.00@15.25	Steel Cr'p Ends	21.00@21.50
White	14.50@14.75	Steel Bl. Ends	21. 0
Mottled	14.50@14.75	Ferro-Man., 80% f.o.b. Oct. New York	71.80
Silvery	17.50@18.25	Steel Billets	31.00@31.50
Bessemer	18.75@19.00	Old Iron Rails	27.00@
Low Phos	24.00@24.50	Old Steel Rails	21.50@22.00
Charcoal Pig—		No. 1 W. Scrap	20.00@21.00
Foundry No. 1	23.50@24.50	No. 2 W. Scrap	18.00@
Foundry No. 2	22.00@22.75	Steel Rails	32.00@
Cold-Blast	25.00@29.00	" light sec.	32.00@36.00
Warm-Blast	24.00@25.00	Bar Iron, nom.	1.85@ 1.90
10 + 12% Spiegel f. o. b. Balt.	29.60	Iron Nails	1.90
		Steel Nails	1.90
		Wire Nails	2.25@ 2.30

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 25.

Heavy Chemicals.—On account of the advancing tendency in this market, the demand has decreased somewhat during the week. The inquiry here as well as on the other side has been mostly for caustic soda, but as sellers' prices have been higher than buyers apparently care to pay, it has not resulted in much actual trading. Dealers and agents of Liverpool firms in this city profess to be uninformed as to the latest developments in the Chemical Union. That the organization has not yet been perfected is about all that is known. According to the *Pall Mall Gazette*, the combination of all the alkali works of the kindgdom, if effected, will surpass anything of the kind hitherto attempted in that county. The Salt Union was floated with a capital of £4,000,000, but in the case of the alkali works £8,000,000 to £9,000,000 is the figure mentioned.

Caustic soda, 74-76 per cent. is quoted at 2¾c. and 76-77 at the same price. This article continues the feature of the market. Rumors of still higher prices are numerous, and inquiry for future delivery is good. Arrivals just now are quite scarce.

Caustic soda ash is dull and neglected at 1·50c.@1⅝c.

Carbonated soda ash is firm. For both the 48 per cent. and 58 per cent. grades, 1·50 c. is quoted.

Sal soda is dull, and nothing of interest is to be noted. Quotations are 1c.@1·05c.

Bleaching powder is improved so far as the price is concerned, but as to actual business it is neglected. For Liverpool brands, 1·50c. is asked and 1·40c. for Newcastle.

Acids.—No news of interest and no change in the situation can be reported of this market. Manufacturers continue to report a good volume of business, but prices show not the slightest inclination to return to their former higher figures. Rumors of prices still lower than those quoted in the appended list are afloat, it being said, among other things, that sulphuric acid has been offered for what practically amounted to 60c. We quote this week acid, per 100 pounds in New York and vicinity: Acetic, $1.75@$2.25; muriatic, 18-degree, 80c.@$1.25; muriatic, 20-degree, 90c.@$1.50; muriatic, 22-degree, 90c.@$1.75; nitric, 36-degree, $2.75@$3.50; nitric, 40-degree, $3.25@$4.50; nitric, 42-degree, $3.75@$4.75; sulphuric, 60-degree, 70@80c., and sulphuric, 66-degree, 80c.@$1.

Fertilizing Chemicals.—There has been some inquiry for ammoniates for Fall delivery, and for a few raw materials, otherwise nothing of interest is doing in the market for fertilizers. Prices show but little change over last week. We quote: High grade dried blood, $1.90@$1.95. For the low grade the price is $1 80@$1.85; Azotine, $1.90@$1.95. Tankage, high grade, 9 to 10 per cent. ammonia and 15 to 20 per cent. phosphate, $19@$20 per ton, and low grade 7 to 8 per cent. ammonia and 25 to 30 per cent. phosphate, $18@$18.50. Fish scrap, $20.50@$21 per ton f. o. b. factory. Sulphate of ammonia at $3.10@$3.15 per cwt. Concentrated tankage, $1.80@$1.85. Refuse, bone black, guaranteed 70 per cent. phosphate, $18.50@$19 per ton. Dissolved bone-black is nominally 95c. per unit for available phosphoric acid, although on large lots prices might be somewhat reduced, and acid phosphate 80c. per unit for available phosphoric acid. Steamed bones, unground, $20@$23; ground, $25@$26.

Charleston rock, undried, $5.75 per ton; kiln-dried, $7@$7.25 per ton, f. o. b. vessels and cars respectively at the mines. Freights by sail from Charleston to New York, $2.75@$3.50 per ton. Charleston rock, ground $11.50@$12, ex vessel at New York.

Quotations are for 48 to 52 per cent. sulphate of potash, $1.12½ per 100 pounds for shipments from date; high grade manure salts, basis 90 per cent. sulphate of potash, $2.37½ per 100 pounds.

Messrs. Millar & Co., of Montreal, writing under date of the 22nd inst., state that shipments of phosphate from Montreal, as per Custom House manifests from the 17th of June to the 15th inst., amounted to 3,389 tons shipped variously to Liverpool, Glasgow, London, Swansea and Hamburg.

Muriate of Potash.—There have been some sales at the usual prices, but no arrivals are to be reported this week. Quotations are according to quantity, $1.77½@$1.85.

Nitrate of Soda.—Quotations for nitrate for both spot and future delivery are $1.70. The trade is quiet.

Brimstone.—Consumers are pretty well supplied and are unwilling to come into the market at the present figures. Spot quotations are, for best unmixed seconds, $21, and for thirds, $20.

Liverpool. July 16.

[Special Report by Messrs. J. P. Brunner & Co.]

The continued favorable prospects with regard to the formation of the "Chemical Union" seem to have caused the market to be excited, and a large business in chemicals has been the result.

Soda Ash in good demand at 1¼d. to 1⅜d. for caustic ash, and 1¼d. to 1⅜d. for carb. ash, according to brands.

Soda Crystals very firm, and selling freely at £3 5s. to £3 7s. 6d. per ton.

Caustic Soda.—Rather more offered. Quotations range from £8 15s. to £9 for 60 per cent.; £9 15s. to £10 for 70 per cent.; £10 10s. to £10 15s. for 74 per cent., and £11 10s. to £12 for 76 per cent.

Bleaching Powder.—A marked improvement has been experienced in the demand, prices for which have risen considerably. Early this week sales were made for prompt delivery at £5 10s., and £6 was paid for August and September delivery, and more money is now asked by makers. This is American business that the £6 refers to, as the same article is still obtainable in softwood casks at makers' works at £5 5s., so the demand for export packages would seem to be mainly speculative.

Chlorate of potash has advanced, and a good business has been done. Quotations are 4¼d.@5d. per lb.

Bicarb. soda in good demand at £5 15s.@£6 per ton and upward, for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia continues to meet with a good inquiry from America, and sales at £11 12s. 6d.@£11 15s. per ton for good gray, 24 per cent. f. o. b. Liverpool.

Another Liverpool correspondent writes:

The long talked of combination between the chemical manufacturers of this country appears to be assuming a more definite form. Failing to arrive at an *entente cordiale* among themselves, they have been approached by, and are now in negotiation with a large financial syndicate in London with a view to the disposal of the works, under a scheme similar to the Salt Union, and similar to what was attempted in the tinplate trade 18 months ago. If all one can glean from unofficial, but reliable sources of information may be depended on, the nature and extent of the negotiations are kept very close, the terms offered by the London syndicate have been accepted by all but two manufacturers, one at St. Helens and the other at Widness. It is, perhaps, rather early in the day to express any strong opinion on the feasibility of this scheme, but while there is little to be said in its favor for the syndicate, there is not much doubt that the present proprietors would be only too glad to find themselves out of the trade on anything like reasonable terms. How to maintain a monopoly in chemical manufacture is a problem which apparently the syndicate alone has been able to solve. If they have not done so yet, it will be doubly difficult to do so by and by when the large salt deposits in the north-east counties, and around the Barrow district have become better developed.

It is understood that the failure to carry out what is known as the Widnes Brine Scheme—the laying of brine pipes from Cheshire—has, more than anything else, induced the Lancashire chemical manufacturers to entertain the present scheme.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, July 25.

Bricks.—A large amount of bricks is still coming forward, and fortunately the demand also continues good, although slightly less than the supply. Varieties of bricks selling at from $5 to $5.50 per thousand are sought after with some eagerness. Quotations this week are Haverstraws, $5.25@$6 per M., with the lower grades in good demand. Uprivers, $5@$5.25; Jerseys, $4.50@$5.25, and Pales, $3@$3.25.

Lime.—There is not much lime in this market just now, both the supply and the demand being quite moderate. With the exception of two or three cargoes on the way, no lime is coming forward. A great many vessels, including a number from the regular lime-fleet, are loading with stone and consequently freight ships are difficult to obtain. No news from the recently disbanded Knox County (Maine) Lime Association, or combination of the lime burners of the Rockland and Rockfort districts, has been received, but it is pretty well understood that a renewal of the association is not to be looked for, at least, not in the near future. Thus far the disorganization of the combination has not resulted in cut-throat competition, but when the demand becomes greater dealers may show more anxiety to market their product and we may see more bitterness. Quotations remain as reported last week: Rockland, common and finishing, 90c. and $1.20; St. John, common and finishing, 85@95c.; Glen Falls, common and finishing, 85c.@$1.10.

NOTES OF THE WEEK.

An English syndicate has offered the Westmore & Morse Granite Company $200,000 for its works at Montpelier and its quarry at Barre, Vt. The company will hold a special meeting to consider the proposition. Several stockholders are known to favor the sale. The property is valued at about $100,000. The syndicate is also endeavoring to buy out as many granite firms at Barre as will sell. It is understood that six have already practically agreed to sell. If the sale is consummated, the granite business in the two places will be revolutionized. The present system is one of small sheds, employing 10, 20 and 30 men each. The recent labor difficulties have undoubtedly influenced many small firms to consider the proposition favorably.

The stone cutters in Joliet, Ill., have gone on strike for an advance in wages. They are now receiving $3.50 per day, and want $4.

IMPORTS AND EXPORTS OF METALS AT NEW YORK JULY 12 TO JULY 19 AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Amer. Metal Co....	50	272
Hendricks Bros....		50
La Marche's Sons, H....		5
Lewisohn Bros....		50
Meyer, G. A. & E....		9
Milne & Co....		74
Muller, Schall & Co.	30	123
Total....	80	583
Corres. date, 1889..	70	458

Pig Lead.	Lbs.	Lbs.
Caswell, E. A....		111
Hendricks Bros....		50
Schultz & Co., A....		98
G. W. Sheldon....		149
Total....		408
Corres. date, 1889..		129

Tin.	Tons.	Tons.
Abbot, Jere, & Co.		50
Amer. Metal Co....		2,125
Bidwell & French.		765
Bruce & Cook....		10
Carter, Hawley & Co	25	75
Cohen, H....		20
Cort & Co., N. L....		50
Crooks & Co., R....		75
Davol & Son....	9	24
Hendricks Bros....		26
Lehmaier, S., & Co.		92
Lewisohn Bros....		20
Merchant & Co		20
Muller, Schall & Co.		620
Naylor & Co....	25	1,146
Nissen, Geo....		10
Phelps, Dodge & Co....		2,350
Thomson, A. A. & Co....		30
Thomson, D. & Co.	10	60
Townsend, & Co., J. R....		50
Trotter & Co., N....		75
Total....	69	7,693
Corres. date, 1889..	782	6,199

Tin Plates.	Boxes.	Boxes.
Bruce & Cook....	3,637	74,344
Byrne & Son....		1,000
Central Stamp. Co.	1,483	47,417
Coddington & Co...	7,579	73,374
Cohn & Co	102	12,364
Con. Fruit Jar Co.		120
Corbiere F. & Co...	1,050	7,317
Cort & Co..	5,762	93,948
Crooks & Co....	2,163	38,259
De Milt & Co, H R.	340	3,034
Dickerson, V. D. & Co	14,014	212,722
Fenton, D. E....	777	1,037
Haberman, F....		66
Herring, Chas. E.		1,000
Iron Clad Mfg. Co.		379
Lalance & G. M. Co.		8,533
Lazard Bros.		1,048
Lehmaier, Schw'z & Co...		200
Merchant & Co....	1,657	16,271
Mersick & Co..	288	6,735
Morewood & Co...	1,000	36,492
Newell Bros.		416
Payne, S. H. & Co.		684
Pratt Mfg. Co....	3,449	70,445
Phelps, Dodge & Co	67,836	491,740
Shepard & Co....	429	3,548
Taylor, N. & G....		1,229
Thomson & Co., A. A.	569	71,633
Warren, J. M		3,530
Wheeler & Co....	1,512	16,911
Whittemore & Co.	467	12,520
Wolff & Reesing....		2,077
Wright, Peter & Co.		227
Total....	114,114	1,310,520
Corres. date, 1889.	50,791	1,338,506

Pig Iron.	Tons.	Tons.
Abbott & Co., Jere.		200
Baldwin & Co., A..	200	807
Baldwin Bros. & Co.		170
Crocker Bros.		900
Crooks & Co., R....		5
Dana & Co....		150
Geisenheimer & Co		76
Hagermeyer & Brun		30
Irvin. R. I. & Co .		300
Lillienberg, N....		1,909
Naylor & Co....		150
Pierson & Co....		30
Sheldon, G. W. & Co.		200
Stetsson & Co., G. W.		1,725
Williamson, J. & Co.		1,250
Total....	200	7,902
Corres. date, 1889..	950	15,081

Steel Blooms, Billets, and Slabs.	Tons.	Tons.
Baldwin Bros. & Co....		2
Dana & Co....	314	1,670
Downing, R. F. & Co.		5
Henderson Bros....		1
Martin & Co		80
Milne, A., & Co....		68
Pope, Jas. E., Jr.		61
Richards & Co. C. B.		1
Roebling's Sons, J. A.	15	2,074
Wolff, & Co., R. H.		60
Total....	329	4,022
Corres. date, 1889..	1,299	49,208

Bar Iron.	Tons.	Tons.
Abbott & Co., Jere.	240	736
Bacon & Co....		843
Crocker Bros....		77
Dickerson, Van Dusen & Co....		6
Downing & Co....		285
E. J. Jacobus....		7
Fuller, Dana & Fitz.		11
Holt, H. N....		60
Lilienberg, N....		447
Lundberg, G....	370	1,957
Milne & Co....	55	849
Muller, Schall & Co.		289
Naylor & Co....		285
Page, Newell & Co.	101	1,563
Plenty, J		14
Wilson, J. G....		3
Total....	766	7,432
Corres. date, 1889..	941	4,626

Scrap Iron.	Tons.	Tons.
Crossman & Co., W. H.		30
Muller, Schall & Co.		18
Samper & Co., S.		186
Stevens, Corvin & Co.		30
Ward, J. E. & Co..		492
Total....		756
Corres. date, 1889..		1,058

Steel and Iron Rods.	Tons.	Tons.
Abbott & Co....	492	6,591
American S. Co....		665
Bacon & Co....	377	450
Carey & Moen....	87	351
Cooper, Hewitt & Co....		371
Dana & Co.		498
Downing & Co....	48	129
Galpin, S. A....		1,066
Greely & Co. C. S.		35
Hazard Mfg. Co.	23	286
Jacobus, E. Y....		2
Lee, James & Co...		1,249
Lillienberg, N.		300
Lundberg, G....		126
Milne & Co....	300	756
Muller, Schall & Co.		682
Naylor & Co....	212	3,987
Page, Newell & Co.	50	1,179
Roebling's Sons, J. A....		2,027
Schulze & R.		1
Temple & Lockwood....		6
Wiebusch & Ho...		4
Wood & Niebuhr..		25
Wolf & Co., R. H..	12	2,745
Total....	1,601	23,531
Corres. date, 1889..	1,074	28,558

Old Rails.	Tons.	Tons.
Bowring & Archibald....		340
Frankfort, M....	445	4,027
Henderson Bros....		300
Hernsheim, L		350
Mosle Bros....		123
Naylor & Co....		1,968
Sawyer, Wallace & Co....		610
Total....	445	7,718
Corres. date, 1889..		9,135

Spiegeleisen.	Tons.	Tons.
Abbott, Jere & Co.		2,725
Blakely & McLellan....		1,684
Crocker Bros....	1,203	15,594
Crooks & Co., R....		100
Dana & Co....	933	15,500
Foley, F....		50
Geisenheimer & Co.		338
Hernsheim, L....		14,035
Holt, H. N....		200
Naylor & Co....	25	9,931
Perkins, C. L....		1,400
Sachs & Richmond.		2
Whittemore, H. & Co.		40
Total....	2,161	61,605
Corres. date, 1889...	1,537	42,149

Iron Ore.	Tons.	Tons.
Baiz, Jacob....		67
Bowring & Archibald.	500	3,592
Earnshaw, A....	324	3,517
Ennis, Andrew....		438
Flores & Co., R. de	639	11,187
Johnson & Co., L....		5,030
Total....	1,463	23,831
Corres. date, 1889..		7,970

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co., Jere.	447,905	2,522,603
Amer. Met. Co., L.	23,400	904,208
Barber & Co		13,750
Belmont, Aug. & Ce		1,763,974
Burgass & Co....		173,734
French, Edye & Co....		135,374
Heidelbech, Sicheimer & Co ..		672,608
Seamen, S. H....		66,950
Ward, J. E. & Co.		100,000
Wil'ms & T'hune..		112,004
Total....	471,305	6,471,205
Corre. date, 1889.	1,130,887	4,292,454

Copper Matte.		
American Metal Co	2,523,079	
Lewisohn Bros.	203,743	1,703,846
Nichols, Geo. H....		267,202
Paulsen, Wm....		1,039,428
Wil'ms & T'hune..		2,848,706
Total	203,743	8,382,261
Corres. date 1889.	2,300,865	15,113,339

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Adams & L.	Colo.	$1,500,000	150,000	$10	*	....	.....
2	Alice, S. C.	Mont	10,000,000	400,000	25	*	....	.....
3	Alma & Nel Wood C. G.	Idah	300,000	30,000	10	*	....	.....
4	American & Nettie, G.	Colo.	.....	300,000	..	.....	....	.....
5	Amy & Silversmith, S.	Mon.	.....	341,419	..	.....	....	.....
6	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl. 1875	$1.00
7	Argenta, S.	Nev.	10,000,000	100,000	100	335,000	July 1889	.10
8	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*	....	.....
9	Aurora, L.	Mich	2,000,000	100,000	20	*	....	.....
10	Badger, S.	Ont.	250,000	50,000	5	*	....	.....
11	Bassick, G. S.	Colo.	10,000,000	100,000	100	*	....	.....
12	Belle Isle, S.	Nev..	10,000,000	100,000	100	*	....	.....
13	Belcher, G. S.	Nev..	10,400,000	104,000	100	2,028,000	Apl. 1890	.50
14	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	120,000	Dec. 1889	.25
15	Bodie Con., G. S.	Cal	10,000,000	100,000	100	575,000	Nov 1889	.25
16	Boston & Mont, G.	Mon	2,500,000	250,000	10	*	....	.....
17	Boston & Mont., C. S.	Mon	2,500,000	100,000	25	*	....	.....
18	Breece, S.	Colo	5,000,000	200,000	25	*	....	.....
19	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	*	....	.....
20	Bulwer, G.	Cal..	10,000,000	100,000	10	130,000	Aug. 1889	.25
21	Bunker Hill & Sull.	Idah.	3,000,000	300,000	10	*	....	.....
22	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May 1885	.15
23	Calliope, S.	Colo.	1,000,000	1	1	*	....	.....
24	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000	..	.....
25	Carbonate Hill, S. L.	Colo.	1,500,000	200,000	10	*	....	.....
26	Carlisle, G.	N. M.	1,000,000	200,000	5	*	....	.....
27	Castle Creek, G.	Idah.	100,000	100,000	1	*	....	.....
28	Catalpa, S. L.	Colo.	3,000,000	300,000	10	*	....	.....
29	Central, C.	Mich	500,000	20,000	25	100,000	Sept 1861	.06
30	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*	....	.....
31	Colorado Central, S. L.	Colo.	2,750,000	275,000	10	*	....	.....
32	Confidence, S. L.	Nev..	.....	24,000	....	306,160	Mar. 1890	.75
33	Cons. Cal. & Va., S.	Nev.	21,000,000	210,000	..	108,000	Jan. 1885	.20
34	Contention, S.	Ariz.	12,500,000	250,000	50	*	....	.....
35	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10	*	....	.....
36	Crescent, S. L. G.	Utah	15,000,000	600,000	25	*	....	.....
37	Crown Point, G. S.	Nev..	10 000,000	100,000	100	2,850,000	Sept 1880	.50
38	Daly, S.	Utah	3,000,000	150,000	20	*	....	.....
39	Deer Creek, S. G.	Idah.	1 000,000	200,000	..	*	....	.....
40	Deadwood-Terra, G.	Dak..	5,000,000	200,000	25	*	....	.....
41	Derbec B. Grav., G. S.	Cal..	10,000,000	100,000	100	90,000	Dec. 1881	.10
42	Dunkin, S. L.	Colo.	5,000,000	200 000	25	*	....	.....
43	Dunstone, G. S. L.	Mont	1,,000,000	200,000	5	*	....	.....
44	Eclipse.	Colo.	100,000	100,000	1	*	....	.....
45	Elkhorn, G.	Mont.	1,000,000	100,000	10	50,000	July 1883	.50
46	Empire Lt., G.	Mont	500,000	100,000	5	*	....	.....
47	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	550,000	Jun. 1889	.50
48	Evening Star, S. L.	Colo.	500,000	50,000	10	*	....	.....
49	Excelsior, G.	Cal..	10,000,000	100,000	100	560,000	Sept 1885	1.00
50	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov 1878	1.00
51	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun. 1871	.....
52	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*	....	.....
53	Garfield Lt., G. S.	Nev.	500,000	100,000	5	*	....	.....
54	Gould & Curry, G. S.	Nev..	10,800,000	108,000	100	4,465,500	Apl. 1890	.30
55	Grand Prize, S.	Nev..	10,000,000	100,000	100	715,000	Nov. 1889	.30
56	Granite, S. L.	Idah.	500,000	500,000	1	*	....	.....
57	Granite Mountain, S.	Mont	10,000,000	400,000	25	*	....	.....
58	Green Mountain, G.	Cal..	1,250,000	125,000	10	*	....	.....
59	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,000	July 1887	.50
60	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50	*	....	.....
61	Hel'a Mg & Red, G. S. L.	Mont	3,315,000	663,000	5	*	....	.....
62	Holmes, S.	Nev.	10,000,000	100,000	100	325,000	Mar. 1890	.25
63	Holyoke, G.	Utah	500,000	200,000	2	37,500	Apl. 1889	.05
64	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July 1878	1.00
65	Honorine, S. L.	Utah	500,000	250,000	2	37,500	Apl. 1889	.05
66	Hope, S.	Mont	1,000,000	100,000	10	*	....	.....
67	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*	....	.....
68	Hubert, G.	Colo.	1,000,000	1 mil'n	1	*	....	.....
69	Idaho, G.	Cal..	310,000	3,100	100	.....	....	.....
70	Ideal, S.	Cal..	1,500,000	50,000	10	*	....	.....
71	Illinois, S.	N. M.	100,000	100,000	1	*	....	.....
72	Independence, S.	Nev..	10,000,000	100,000	100	340,000	Oct. 1886	.20
73	Iron Hill, S.	Dak.	2,500,000	250,000	10	134,000	Jaly 1889	.03
74	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*	....	.....
75	Jackson, G. S.	Nev.	5,000,000	50,000	100	237,500	Nov 1880	.20
76	Jay Gould, G.	Mont	2,000,000	40,000	50	*	....	.....
77	Joculstita, G.	Mex.	2,500,000	250,000	10	.....	....	.....
78	Jumbo, G.	Colo.	2,000,000	200,000	10	.....	....	.....
79	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000	Oct. 1887	1.00
80	Kentuck.	Nev.	3,000,000	30,000	100	369,000	Dec. 1889	.30
81	La Plata, S. L.	Colo.	2,000,000	200,000	10	*	....	.....
82	Leadville Cons., S. L.	Colo	1,000,000	100,000	10	*	....	.....
83	Lexington, G. S.	Mont	4,000,000	40,000	100	*	....	.....
84	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*	....	.....
85	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*	....	.....
86	Martin White, S.	Nev..	10,000,000	100,000	100	100,000	Feb. 1890	.25
87	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*	....	.....
88	Matchless, S.	Colo.	500,000	500,000	1	*	....	.....
89	May Mazeppa.	Colo.	1,000,000	100,000	1	.....	....	.....
90	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl. 1886	1 00
91	Mono, G.	Cal.	5,000,000	50,000	100	102,850	Nov. 1889	.25
92	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*	....	.....
93	Morning Star, S. L.	Colo.	1,000,000	100,000	10	.....	....	.....
94	Moulton, S.	Colo.	2,000,000	400,000	5	*	....	.....
95	Mount Pleasant, G.	Cal.	150,000	150,000	1	*	....	.....
96	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun. 1880	2.00
97	Napa, Q.	Cal..	700,000	100,000	7	*	....	.....
98	Navajo, G. S.	Nev..	10,000,000	100,000	100	485,000	Apl. 1888	.30
99	New Guston, S.	Colo.	500,000	100,000	5	*	....	.....
100	N. Hoosic Hill, G. S.	N. C.	2,500,000	120,000	2½	*	....	.....
101	Northern Belle, S.	Nev.	5,000,000	100,000	100	425,000	Jan. 1884	8.50
102	North Belle Isle, S.	Nev..	10,000,000	100,000	100	400,000	Sept 1889	.20
103	North Star, G.	Cal..	1,000,000	100,000	10	*	....	.....
104	Ontario, S. L.	Utah	15,000,000	150,000	100	*	....	.....
105	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,159,440	May 1889	.50
106	Original, S. C.	Mont	1,500,000	60,000	25	*	....	.....
107	Osceola, C.	Mich	1,250,000	125,000	10	480,000	Apl. 1876	1.60
108	Oxford, G.	N. S	1	125,000	..	*	....	.....
109	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	57,000	Apl. 1888	.15
110	Parrot, C.	Mont	1,800,000	180,000	10	*	....	.....
111	Peacock, S. & C.	N. M.	2,000,000	200,000	10	*	....	.....
112	Plumas Eureka, G.	Cal..	1,400,250	140,625	10	*	....	.....
113	Plutus, G. S. L.	Colo.	2,000,000	200,000	10	*	....	.....
114	Plymouth Con., G.	Cal..	5,000,000	100,000	50	*	....	.....
115	Quicksilver, pref., Q.	Cal..	4,300,000	43,000	100	*	....	.....
116	" com., Q.	Cal..	5,700,000	57,000	100	*	....	.....
117	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec. 1862	.....
118	Republic, G.	Mich.	5,000,000	100,000	50	400,000	Dec. 1889	.30
119	Richmond, S. L.	Nev..	1,350,000	54,000	25	*	....	.....
120	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar 1886	.50
121	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*	....	.....
122	Robert E. Lee, S. L.	Colo	10,000,000	600,000	20	*	....	.....
123	Savage, S.	Nev..	11,200,000	112,000	100	6,542,000	July 1889	.50
124	Shoshone, G.	Idah.	150,000	150,000	1	.....	....	.....
125	Silver Button, G.	Cal..	2,325,000	122,500	10	.....	....	.....
126	Sierra Nevada, G. S.	Nev..	10,000,000	100,000	100	6,250,000	Oct. 1889	.50
127	Sierra Nevada, S. L.	Idaho	1,000,000	1	1	*	....	.....
128	Silver Cord, G. S. L.	Colo.	4,500,000	450,000	10	*	....	.....
129	Silver King, S.	Ariz.	10,000,000	100,000	100	80,000	Jan. 1890	.30
130	Silver Mg. of L. V.	N. M.	500,000	500,000	1	*	....	.....
131	Silver, S. L.	Colo.	2,000,000	200,000	10	*	....	.....
132	Small Hopes Cons.	Colo.	5,000,000	250,000	20	*	....	.....
133	Spring Valley, G.	Cal..	200,000	200,000	1	50,000	Oct. 1886	.25
134	Standard, G. S.	Cal..	10,000,000	100,000	100	50,000	Feb. 1890	.25
135	Stormont, S.	Utah	500,000	500,000	1	*	....	.....
136	St. Joseph, L.	Mo..	1,500,000	150,000	10	*	....	.....
137	Swansea, G.	Mont	600,000	60,000	10	*	....	.....
138	Tamarack, S.	Mich.	1,000,000	40,000	25	520,000	Apl. 1885	3.00
139	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept 1883	.25
140	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	*	....	.....
41	United Verde, C.	Ariz.	3,000,000	300,000	10	*	....	.....
142	Valencia, M.	N. H.	150,000	1,500	100	*	....	.....
143	Viola Lt., S. L.	Idah.	750,000	150,000	5	*	....	.....
144	Ward Cons., S. L.	Colo.	2,000,000	200,000	10	*	....	.....
145	Yankee Girl	Colo.	2,500,000	250,000	10	*	....	.....
147	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,508,000	Mar	1889 .50
148	Webb City, L. Z.	Mo..	55,000	11,000	5	.....	....	.....
149	Woodside	Utah	.....	.....	..	.....	....	.....
141	Young America	Cal..	.....	.....	..	.....	....	.....

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied.	Assessments. Date & am't of last.
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	* ....
2	Alleghany, S.	Colo.	5,000,000	500,000	10	....
3	Allouez, C.	Mich	2,000,000	80,000	25	$737,000 Jan. 1890 7½
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	588,750 July 1889 .50
5	Alta, S.	Nev..	10,080,000	100,800	100	2,248,800 Sept 1888 .50
6	Amador, G.	Cal..	400,000	200,000	2	* ....
7	American Flag, S.	Colo.	1,250,000	125,000	10	300,000 Jun 1877 ....
8	Amity, S.	Colo.	250,000	250,000	1	....
9	Angio-Montana, Lt.	Mon.	600,000	120,000	5	* ....
10	Astoria, G.	Cal..	200,000	100,000	2	* ....
11	Barcelona, G.	Nev..	5,000,000	200,000	25	* ....
12	Bechtel Con., G.	Cal..	10,000,000	100,000	100	173,500 Jan. 1883 .10
13	Belmont, S.	Nev..	5,000,000	50,000	100	735,000 Apl. 1886 .10
14	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,180,590 Jan. 1890 .25
15	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	* ....
16	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	* ....
17	Black Oak, G.	Cal.	3,000,000	300,000	10	* ....
18	Boston Con., G.	Cal..	10,000,000	100,000	100	170,000 Nov 1888 .25
19	Bremen, S.	N. M.	5,000,000	500,000	10	* ....
20	Brownlow, S.	Colo.	250,000	250,000	1	....
21	Brunswick, G.	Cal..	2,000 000	400,000	5	* ....
22	Bullion, G. S.	Nev..	10,000,000	100,000	100	4,007,000 Aug. 1888 .50
23	Calaveras, G.	Cal..	500,000	500,000	1	* ....
24	Carisa, G.	Wy	500,000	100,000	5	* ....
25	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	* ....
26	Chamberlain, G.	Colo.	500,000	250,000	2	* ....
27	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	* ....
28	Cherokee, G.	Cal..	1,500,000	150,000	10	* ....
29	Chollar, S.	Nev..	11,200,000	112,000	100	1,484,000 July 1889 .50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	* ....
31	Colchis	N. M.	500,000	50,000	10	....
32	Commonwealth, S.	Nev.	10,000,000	100,000	100	170,000 Nov 1887 .50
33	Comstock, G. S.	Nev.	10,000,000	100,000	100	30,000 Mar. 1887 .10
34	Con. Imperial, G. S.	Nev..	5,000,000	50,000	100	1,802,500 Nov. 1889 .05
35	Con. Pacific, G.	Cal..	6,000 000	60,000	100	192,000 Oct. 1889 .10
36	Cons. Silver, S.	Mo..	2,500,000	250,000	10	....
37	Crescent, S. L.	Colo.	3,000,000	300,000	10	* ....
38	Crocker, S.	Ariz.	10,000,000	100,000	100	135,000 Jan. 1890 .10
39	Crozall, G.	N. C.	500,000	500,000	1	* ....
40	Dahlonega, G.	Ga..	250,000	250,000	1	* ....
41	Dandy, S.	Colo.	5,000,000	500,000	10	* ....
42	Decatur, S.	Colo.	1,500,000	300,000	5	* ....
43	Denver City, S. L.	Colo.	5,000,000	500,000	10	* ....
44	Denver Gold, G.	Colo.	300,000	60,000	5	* ....
45	Durango, G.	Colo.	500,000	500,000	1	* ....
46	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000 Mar. 1886 1.0
47	El Cristo, G. S.	U.S.C	1,000,000	500,000	2	* ....
48	El Dorado, G.	Cal.	1,000,000	250,000	4	* ....
49	El Talento, G.	U.S.C	1,000,000	500,000	2	* ....
50	Empire, S.	Utah	10,000,000	100,000	100	* ....
51	Eureka Tunnel, S. L.	Nev..	10,000,000	100,000	100	* ....
52	Exchequer.	Nev.	10,000,000	100,000	100	615,000 Apl. 1889 .25
53	Found Treasure, G. S.	Nev..	10,000,000	100,000	100	30,550 Apl. 1889 2½
54	Gogebic I. Syn., I.	Wis.	5,600,000	200,000	25	* ....
55	Gold Cup, S.	Colo.	500,000	500,000	1	* ....
56	Golden Era, S.	Mon.	2 000,000	200,000	10	* ....
57	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314 Dec. 1885 .25
58	Gold Rock, G.	Cal.	1,000,000	500,000	2	* ....
59	Goodshaw, G.	Cal.	10,000,000	100,000	100	* ....
60	Grand Belt, C.	Tex.	12,000,000	120,000	100	....
61	Grand Duke.	Colo.	800,000	80,000	10	....
62	Great Romance, G.	U.S.C	1,000,000	500,000	2	* ....
63	Gregory-Central, G.	Colo.	550,000	550,000	1	* ....
64	Gregory Con., G.	Mon.	3,000,000	300,000	10	* ....
65	Harlem M. & M. Co, G.	Cal..	2,000,000	200,000	5	* ....
66	Head Cent. & Tr. S. G.	Ariz.	10,000,000	100,000	100	....
67	Hector, G.	Cal..	1,500,000	300,000	5	45,000 Jan. 1889 .15
68	Highland, G.	Mich	500,000	25,000	20	....
69	Hollywood.	Cal.	200,000	100,000	2	....
70	Hudson, S.	Colo.	2,000,000	200,000	10	....
71	Huron, C.	Mich	1,000,000	40,000	25	280,000 May 1887 3.0
72	Iron Gold & Silver, S.	N. M.	2,000,000	200,000	10	* ....
73	Ironton, I.	Wis.	1,000,000	40,000	25	....
74	Iroquois, C.	Mich	1,250,000	50,000	25	....
75	J. D. Reymert.	Ariz.	10,000,000	100,000	100	....
76	Julia Cons., G. S.	Nev.	11,000,000	100,000	100	1,660,000 Jan. 1889 .10
77	Lacrosse, G.	Colo.	1,000,000	100,000	10	* ....
78	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	* ....
79	Mayflower Gravel.	Cal..	1,000,000	100,000	10	585,000 Mar. 1890 .50
80	Medora, G.	Dak.	250,000	250,000	1	* ....
81	Mexican, G. S.	Nev..	10,000,000	100,000	100	2,300,760 Dec. 1889 .25
82	Middle Bar G. S. L.	Cal..	400,000	200,000	2	* ....
83	Mike & Starr, S. L.	Colo.	1,000,000	200,000	5	* ....
84	Mollie Gibson.	Colo.	2,000,000	1,000,000	2	* ....
85	Monitor, G.	Colo.	100,000	1,000,000	1	* ....
86	Mutual Mg. & Sm.	Wash	100,000	100,000	1	* ....
87	Native, C.	Mich	1,000,000	40,000	25	....
88	Neath, G.	Mich	1,000,000	100,000	10	....
89	Nevada Queen, S.	Nev	10,000,000	100,000	100	250,000 Oct. 1889 .25
90	New Germany, G.	N. S.	100,000	100,000	1	* ....
91	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	* ....
92	N. Commonw'lh, S.	Nev.	10,000,000	100,000	100	60,000 Apl. 1889 ....
93	North Standard, G.	Cal..	10,000,000	100,000	100	20,000 Nov .....
94	Occidental, G.	Cal..	600,000	60,000	10	208,000 Dec. 1881 .10
95	Oneida Chief, G.	Cal..	500,000	125,000	100	* ....
96	Oriental & Miller, S.	Nev..	10,000,000	400,000	25	* ....
97	Osceola, G.	Nev..	5,000,000	500,000	10	* ....
98	Overman, G. S.	Nev.	11,520,000	115,200	100	3,823,460 Dec. 1889 ....
99	Park, S.	Utah	2,000,000	200,000	10	....
100	Pearl.	Ariz.	10,000,000	100,000	100	105,000 Sept 1889 .10
101	Peerless.	Ariz.	10,000,000	100,000	100	370,000 Mar. 1889 .25
102	Phœnix.	Aris.	500,000	500,000	1	* ....
103	Phœnix, G. S.	Ark.	5,000,000	200,000	25	* ....
104	Phœnix Lead, S. L.	Colo.	100,000	100,000	1	* ....
105	Pilgrim, G.	Cal..	600,000	300,000	2	* ....
106	Potosi, S.	Nev..	11,200,000	112,000	100	1,461,600 Sept 1889 .50
107	Puritan, S. G.	Idah.	250,000	250,000	1	* ....
108	Quincy.	Colo.	1,500,000	150,000	10	* ....
109	Rappahannock, G. S.	Colo.	3,000,000	300,000	10	* ....
110	Red Elephant, S.	Va..	250,000	250,000	1	* ....
111	Ropes, G. S.	Colo.	500,000	500,000	1	* ....
112	Russell, G. S. L.	Mich	2,000,000	80,000	25	147,200 July 1887 .50
113	Sampson, G. S. L.	N. C.	1,500,000	300,000	5	....
114	San Sebastian, G.	Utah	10,000,000	100,000	100	288,157 July 1888 1.00
115	Santa Fe, C.	San. S	1,600,000	320,000	5	* ....
116	Santiago, G.	N. M.	5,000,000	500,000	10	....
117	Security, S.	U.S.C	400,000	200,000	2	* ....
118	Sheridan.	Colo.	10,000,000	1,000,000	10	....
119	Silver Queen, G.	N. M.	2,000,000	200,000	10	....
120	South Bulwer, G.	Ariz.	5,000,000	200,000	25	* ....
121	South Hite.	Cal..	10,000,000	100,000	100	100,000 May 1881 .25
122	South Pacific.	Cal..	10,000,000	100,000	100	195,000 Jan. 1883 .05
123	Stanislaus, G.	Cal..	500,000	100,000	5	* ....
124	St. Louis & Mex., S.	Cal..	2,000,000	200,000	10	....
125	St. Louis & St. Elmo	Colo.	100,000	100,000	1	* ....
126	St. L. & St. Felipe, G. S.	Mex.	5,000,000	500,000	10	* ....
127	St. L. & Sonora, G. S.	Mex.	1,500,000	150,000	10	....
128	St. Louis-Yavapai.	Ariz.	3,000,000	300,000	10	* ....
129	Sunday Lake, I.	Mich	1,250,000	125,000	10	* ....
130	Sullivan Cons., G.	Dak.	600,000	200,000	3	* ....
131	Sutter Creek, G.	Cal..	500,000	100,000	5	* ....
134	Sutro Tunnel.	Nev..	20,000,000	2,000,000	10	* ....
135	Sylvanite, S.	Colo.	5,000,000	500,000	10	* ....
136	Taylor-Plumas, G.	Cal..	1,000,000	200,000	5	10,000 Feb. 1888 .25
137	Tioga Cons., G.	Cal..	10,000,000	200,000	10	295,000 May 1888 ....
138	Tornado Cons., G. S.	Nev.	100 000	100,000	1	* ....
139	Tortilita, G. S.	Ariz.	1,000,000	100,000	10	* ....
140	Tuscarora, S.	Nev..	10,000,000	500,000	20	160,000 Oct. 1889 .25
141	Union Con., G. S.	Nev..	10,000,000	100,000	100	3,286,000 Feb 1890 .25
142	Utah, S.	Nev..	10,000,000	100,000	100	195,000 Mar. 1890 ....
143	Whale, S.	Colo.	500,000	500,000	1	....
144	Washington, C.	Mich	1,000,000	40,000	25	* ....
145	West Granite Mt., S.	Mon.	5,000,000	500,000	10	....
146	Yuma, C. S. G.	Ariz.	10,000,000	400,000	25	....
147	Zelaya, G. S.	C. A.	600,000	300,000	2	* ....

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia, $240,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,00 in dividends. ¶ 1,000,000.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 19.		July 21.		July 22.		July 23		July 24		July 25.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	...	.....	...	....	1.10	....	....	....	....	...	...	...	300
Argenta, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Atlantic, Mich	....	.....	....	....	....	....	....	....	....	....	....	....	....
Belcher, Nev.	....	.....	....	....	....	....	....	....	2.95	....	....	....	100
Bodie Cons., Cal.	....	.....	4.75	....	....	....	....	....	....	....	....	....	110
Bos. & Mont., Mont.	....	.....	....	....	....	....	....	....	64.13	....	....	....	100
Breece, Colo.	....	.....	.50	....	....	....	.55	.50	....	....	....	....	700
Bulwer, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	....
Caledonia	....	.....	....	....	....	....	....	....	....	....	2 05	2.00	1,200
Calumet & Hecla.	....	.....	....	....	....	....	313¾	....	....	....	316¾	....	30
Catalpa	....	.....	....	....	....	....	....	....	....	....	....	....	....
Colorado Central	....	.....	....	....	....	....	....	....	....	....	....	....	....
Confidence, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va., Nev.	4.20	.....	....	....	4 30	....	4.00	....	4 00	....	....	....	750
Crown Point, Nev	3 00	.....	....	....	....	....	....	....	....	....	....	....	100
Deadwood, Dak	....	.....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Eureka Con.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Excelsior, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet	....	.....	30	....	....	....	....	....	....	....	....	....	200
Franklin	....	.....	....	....	....	....	....	....	27.88	....	....	....	100
Freeland, Colo.	.48	.47	.47	.46	.49	.47	.45	.40	....	....	.48	46	5,300
Gould & Curry, Nev.	....	.....	....	....	2 75	....	....	....	....	....	....	....	100
Hale & Norcross, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	....
Holyoke	....	.....	....	....	....	....	....	....	....	....	....	....	....
Homestake, Dak.	....	.....	....	....	10 38	....	....	....	....	....	....	....	75
Horn-Silver, Ut.	3.50	....	3 50	....	3 5'	....	3.55	....	....	....	3 60	3.55	1,500
Independence, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Iron Hill, Dak.	....	.....	....	....	....	....	....	....	.39	....	....	....	700
Kearsarge	....	.....	....	....	....	....	....	....	....	....	26.33	....	100
Leadville C., Colo.	....	.....	.15	....	.15	....	.14	....	.14	....	.14	....	6,063
Little Chief, Colo.	.35	.....	.35	....	....	....	....	....	....	....	....	....	500
Martin White, Nev.	....	.....	1.30	....	....	....	....	....	....	....	....	....	500
Mono, Cal	....	.....	....	....	....	....	.65	....	....	....	....	....	100
Navajo, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	....
N. Belle Isle, Nev.	....	.....	....	....	....	....	....	....	1.40	....	....	....	100
Ontario, Ut.	....	.....	45 25	45.00	45.25	....	45.00	....	....	....	....	....	337
Ophir, Nev.	4.35	....	4 25	....	....	....	....	....	....	....	5 25	....	500
Osceola, Mich	....	.....	....	....	....	....	47.13	....	....	....	....	....	30
Plymouth, Cal.	....	.....	....	....	....	....	....	....	....	....	7.75	....	100
Quicksilver, Pref.	....	.....	....	....	....	....	42.00	....	40.00	....	....	....	130
" Com.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich.	....	.....	....	....	....	....	....	....	....	....	127⅝	....	50
Robinson Cons. Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	....
Savage, Nev.	4.35	.....	....	....	4.05	....	....	....	....	....	....	....	250
Sierra Nevada, Nev.	3 85	.....	....	....	....	....	....	....	....	....	....	....	100
Silver Cord	....	.....	....	....	27	....	....	....	....	....	....	....	500
Silver King	....	.....	....	....	.60	....	....	....	....	....	....	....	500
Silver Mg. of L. V.	....	.....	....	....	.92	....	....	....	.85	80	....	....	100
Small Hopes, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	400
Stormont, Utah	....	.....	.09	.08	....	....	....	....	....	....	....	....	500
Tamarack, Mich	....	.....	....	....	....	....	231½	....	....	....	....	....	10
Yellow Jacket, Nev	....	.....	....	....	....	....	3 20	....	....	....	....	....	100

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	July 19.		July 21.		July 22.		July 23.		July 24		July 25.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alloues, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Alta, Nev.	1.35	....	1.30	....	1.3	....	1.25	....	1.20	....	1.25	....	500
Andes, Nev.	....	....	....	....	....	....	....	....	.90	....	....	....	200
Amador, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Astoria, Cal.	.05	.04	....	....	.05	.04	....	....	....	....	....	....	1,800
Bechtel	....	....	....	....	....	....	....	....	....	....	....	....	....
Best & Belcher, Nev.	4.05	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza King, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	100
Brunswick, Cal.	.74	.72	.73	.72	.72	....	.72	.71	.71	....	.70	....	4,500
Bullion, Nev.	3 40	....	3.50	....	....	....	....	....	....	....	....	....	200
Butte & Bost., Mont.	....	....	....	....	....	....	....	....	....	....	....	....	....
Castle Creek, Id.	....	....	....	....	....	....	....	....	....	....	....	....	....
Chollar, Nev	4.10	....	....	....	3 95	....	3 90	....	....	....	3.70	....	600
Col. & Beaver, Id.	....	....	....	....	....	....	....	....	....	....	....	....	....
Commonw. Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Comstock T. Nev.	....	....	....	....	....	....	....	....	....	....	.18	....	600
" bonds.	....	....	....	....	....	....	....	....	....	....	.27	....	500
" scrip.	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Imperial, Nev.	....	....	....	....	....	....	....	....	.45	....	....	....	300
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, Rep. of Col.	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer	....	....	....	....	....	....	....	....	....	....	....	....	200
Huron, Mich.	....	....	....	....	....	....	9 00	....	1.10	....	....	....	100
Julia, Nev.	.50	....	.50	....	.47	....	.45	....	.45	....	.45	....	1,600
Justice, Nev.	1.80	....	1.75	....	....	....	....	....	....	....	....	....	200
Kingst'n & Pemb'ke	....	....	....	....	....	....	....	....	....	....	....	....	....
Kossuth	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Lee Basin, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev.	....	....	3 30	....	....	....	3.40	....	3.10	....	3.65	....	400
Minn Iron Co., Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Moniter	....	....	....	....	....	....	....	....	....	....	....	....	....
Mutual Sm. & M. Co	1.75	1.70	1 75	....	1.70	1.65	1.60	....	1.60	....	1.55	....	1,900
Nevada Queen, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Com'nw'th, Nev.	2.75	....	....	....	....	....	....	....	....	....	....	....	200
Occidental, Nev.	1.60	....	1.50	....	1.50	1.35	....	....	1.50	1.40	....	....	3,300
Oriental & Mil., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Overman, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Ariz.	1.35	....	1.35	1 25	1 30	1 25	1.25	....	1.30	....	1 35	1.30	7,000
Potosi, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Rappahannock, Va	....	....	....	....	....	....	03	....	....	....	....	....	500
Santa Fe, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	....
Santiago, U. S. C.	.50	....	....	....	....	....	....	....	....	....	....	....	500
S. Sebastian	.25	....	....	....	....	....	.35	....	.40	....	....	....	1,000
Scorpion	....	....	....	....	....	....	....	....	.40	....	.40	....	400
Shoshone	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver Hill	....	....	....	....	....	....	.60	....	....	....	....	....	100
Sullivan Con., Dak.	....	....	....	....	1.99	....	1.00	....	1.00	....	1 00	....	800
Sutro Tunnel, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
" Trust Cert.	....	....	....	....	....	....	....	....	....	....	....	....	....
Sutter Creek, Cal.	.93	....	.93	....	.95	....	.95	.91	.88	.85	1.00	.85	3,900
Union Cons., Nev.	2.95	....	3 00	....	....	....	....	....	....	....	....	....	300
Utah, Nev.	1.10	....	1.05	....	1 00	....	1.05	....	....	....	1.05	....	1,100

*Ex dividend. †Dealt in at the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. ‖Omited July 18. Dividend shares sold, 22,700. Non-dividend shares sold, 33,100. Total New York, 55,800.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	July 18.		July 19.		July 21.		July 22		July 23.		July 24		SALES.
Atlantic, Mich.	26 25	24 38	27 00	26 50	28.00	27.25	28.00	26 50	*25	24.50	24.00	24.00	3,611
Bodie, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bonanza Developm't	.90	....	....	....	....	....	....	....	.87½	....	.87½	....	300
Bost. & Mont., Mont.	65.00	63 75	65.13	65.00	65.00	64 50	65 50	63 75	64 00	63 50	63 75	63 38	3,275
Breece, Colo.	.50	....	....	....	....	....	40	....	....	....	....	....	100
Calumet & Hecla, Mich.	312	309	315	312	314	312	312	310	316	310	316	315	612
Catalpa, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	1,000
Central, Mich.	....	....	....	....	30 00	....	....	....	....	....	....	....	15
Chrysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Con. Cal. & Va., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Dunkin, Colo.	....	....	....	....	....	....	.65	.60	65	....	....	....	1,300
Eureka, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin, Mich.	26 25	25.50	27.00	26.00	26.50	26.25	26.00	25.00	26 50	26 00	27.75	26.00	6,030
Freeland, Col.	....	....	....	....	....	....	....	....	....	....	....	....	....
Kearsarge	28.50	26 25	28.25	27.50	28.00	27 63	27.88	26 50	26.50	25 63	26 50	25.50	3,090
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Pittsburg, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	....
Martin White, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton	....	....	....	....	....	....	....	....	....	....	....	....	....
Napa, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Osceola, Mich.	46 50	45 50	47.00	46.50	47.00	46 75	47.25	46.75	46.75	46.25	....	....	2 907
Pewabic, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Quincy, Mich.	125	....	126	125	128	126	131	126	*125	....	127½	127	601
Ridge, Mich.	1 38	....	....	....	1.44	....	....	....	....	....	....	....	300
Sierra Nev., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King	....	....	....	....	....	....	....	....	....	....	....	....	....
Stormont, Utah	....	....	....	....	....	....	....	....	....	....	....	....	10
Tamarack, Mich	220	209	227	225	225	224	....	....	220	....	220	....	422

NAME OF COMPANY.	July 18		July 19		July 21.		July 22		July 23		July 24		SALES
Alloues, Mich.	9 91	9.25	10.25	9.88	10 00	9.75	10.00	9.00	10.00	9 25	....	....	8,600
Arnold, Mich.	....	....	....	....	2.00	....	....	....	....	....	2.00	....	700
Aztec, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Bowman S., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Butte & Bost., Mont.	24 00	23 50	24 00	....	24 50	24 25	25 75	23 00	23 50	22.50	23 00	22.50	2,160
Centennial, Mich.	37.50	....	37.75	37 50	38.00	....	....	....	34 00	37.00	....	....	616
Contentment, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Copper F lls Mg	11.50	....	....	....	....	....	11.50	....	....	....	....	....	400
Crescent, Colo.	.18	.17½	....	....	....	....	....	....	.60	....	....	....	600
Dana, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....
Don Enrique, N. M.	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, S. A.	....	....	....	....	....	....	....	....	....	....	....	....	....
Hanover, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Humboldt, Mich.	....	....	....	....	52½	.50	.50	....	....	....	.55	....	500
Hungarian, Mich	....	....	.52½	....	....	....	....	....	52½	....	....	....	200
Huron, Mich.	9 25	9.00	9.25	9.00	9.00	....	8.75	....	8 25	....	....	....	1,055
Mesnard, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
National, Mich.	2.25	2 00	2 38	....	....	....	2.50	....	2 50	....	2 25	....	700
Native, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Or ental & M., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix	....	....	....	....	....	....	....	....	....	....	....	....	....
Pontiac	....	....	....	....	....	....	....	....	....	....	....	....	....
Rockland	....	....	....	....	....	....	....	....	....	....	....	....	....
Santa Fe, N. Mex.	.70	....	.70	....	.70	....	.70	.65	.67½	....	.65	....	2,650
Shoshone, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	....
South Side, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	....
Star	....	....	....	....	....	....	....	....	....	....	....	....	....
Tecumseh Mg. Co.	7.33	7.00	7.0	....	....	....	....	....	....	....	....	....	600
Washington, Mich	....	....	.45	....	....	....	....	....	....	....	....	....	500

*Ex dividend. Boston: Dividend shares sold, 23,663. Non-dividend shares sold, 19,181 Total Boston, 42,944.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	July 19		July 21.		July 22.		July 23.		July 24		July 25.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cambria Iron.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron Coal & Iron Co	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ches. & O. RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Chic. & Ind. Coal RR.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Col., C. & I	100	....	....	....	....	....	....	....	....	52¼	52	51⅝	....	950
Col. & Hocking C. I.	100	....	....	....	31¼	....	32	31¾	31¾	....	31⅞	31⅝	....	300
Consolidation Coal.	100	....	....	....	....	....	26⅝	....	....	....	....	....	....	100
Del. & H. C.	100	....	....	....	....	....	168½	....	....	....	169½	....	167¼	167	615
D., L. & W. RR.	50	148½	148¼	149¼	148½	149	148⅝	149¼	148¾	149⅜	148⅞	149⅜	147¾	4,961
Hocking Valley.	100	31⅛	30¾	32¼	31	32¼	32	32½	31⅞	....	....	31½	30⅝	11,155
Hunt. & Broad Top.	....	....	....	22	....	....	....	22	....	....	....	....	....	250
Do. pref.	....	....	....	47¾	47⅝	47½	47⅝	47½	....	....	....	....	....	253
Illinois Coal & Coke Co.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lehigh C. & N.	50	52½	....	52¼	....	52⅛	....	52¼	52	52⅛	52	....	....	211
Lehigh Valley RR.	50	....	....	52⅝	52½	52¾	....	52¾	52⅝	52⅝	52	....	....	649
Lehigh & Wilkesb. Coal	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Mahoning Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. Prof.	....	....	....	115	....	....	....	....	....	....	....	....	....	100
Marshall Con. Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Essex.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
New Central Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
N. J. C. R. R.	100	125¼	125	125	....	126	....	125¾	126½	126	126	125½	126⅛	126	2 940
N. Y. & S. Coal.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Y., Susq. & Western	100	....	....	....	....	....	....	....	7½	....	7⅛	....	....	120
Do. pref.	100	32¾	....	....	....	....	33⅛	....	....	....	33	....	....	233
N. Y., Perry C. & I.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Norfolk & Western R.R.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	50	....	....	....	....	....	61¼	....	....	....	62	....	....	200
Penn. Coal.	50	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. RR.	50	53¾	53⅝	53⅞	53¾	54	53¾	53⅞	53¾	53⅞	53¾	....	....	4,783
*Ph. & R. RR.	....	45⅞	....	46⅛	46	....	....	46⅛	46	46⅛	45¾	46	45⅛	14,180
Sunday Creek Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Do. pref.	100	....	....	....	....	....	....	....	....	....	....	....	....	....
Tennessee C. & I. Co.	....	....	....	50	....	....	....	....	....	....	....	....	....	300
Do. pref.	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Westmoreland Coal.	....	....	....	....	....	....	....	....	....	....	....	....	....	....

**Sales in New York, 5,850; in Philadelphia, 8,330. Total sales, 42,300.

San Francisco Mining Stock Quotations.

COMPANY	CLOSING QUOTATIONS.					
	July 18	July 19.	July 21.	July 22.	July 23.	July 24.
Alpha	1.35	1.40	.....	.....	.....	.....
Alta	1.25	1.20	1.20	1.25	.....	1.20
Belcher	.....	2.80	.....	.....	.....	.....
Belle Isle	1.10	1.25	1.25	.....	.....	1.30
Best & Bel.	4.20	5.90	3.65	3.85	.....	3.80
Bodie	1.10	1.10	1.05	1.05	.....	1.30
Bulwer	.....	.25	.....	.....	.....	.25
Chollar	4.00	4.00	3.85	3.80	.....	3.50
C'm'weal'h	.....	3 50	3.25	3.25	.....	3.40
Con. C. & V	4.20	.....	3 80	3.80	.....	3.90
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	3.05	2.90	2.60	2.75	.....	2.75
Eureka C.	4.50	.....	.....	.....	.....	.....
Gould & C.	2.90	2 80	2.65	2.70	.....	2.75
Grd. Prize.	.....	.....	.....	.....	.....	.....
Hale & N.	3.00	3 00	2.80	2.95	.....	2.75
M. White.	.....	.....	.....	.....	.....	.....
Mexican	3.35	3.25	3.00	3.35	.....	2.50
Mono.	.....	.60	.60	.....	.....	.70
Mt. Diablo	.....	.....	2 10	.....	.....	2.10
Navajo	.....	.....	.60	.....	.....	.....
Nev. Queen	.....	.....	.70	.....	.....	.75
N. Belle I.	.....	.....	2.10	.....	.....	1.25
Occidental.	.....	.....	.....	.....	.....	.....
Ophir.	4.40	4.15	3.90	4.70	.....	5.13
Potosi.	8.25	8.37	7.63	.....	.....	7.00
Savage	4.30	4.20	4.00	4.05	.....	3.75
Sierra Nev	3.50	3.35	3.10	2.30	.....	3.30
Union Con.	3.00	2.85	2.60	2.90	.....	3.00
Utah	1.05	.95	.90	.....	.....	.95
Yellow Jkt	3.25	3.20	2.95	2.90	.....	3.00

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H.
Atlantic Coal	....	....
Balt. & N. C.	....	....
Big Vein Coal	....	....
Conrad Hill	....	$ 10
Cons. Coal	$ 20@$ 25	.. ..
Diamond Tunnel	....	....
George's Crk. C.	1.10	1.25
Lake Chrome	13@20	35
Maryland & Charlotte	....	....
North State	....	....
Silver Valley	40	....

Prices bid and asked, lowest and highest, during the week ending July 17.

Birmingham, Ala.

COMPANY.	Bid L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$110
Ala Conn. C. & C. Co.	....	$23
Ala. R. Mill Co.	....	$60
*Alice Furnace	$103	....
Anna Howe G. Mg. Co	$⅜	$¾
Bessmer Land.	....	$3 ¼
Bir. Mg. & Mfg.	....	$83
Cahaba Coal Mg. Co	....	$70
Camille Gold Mg. Co	$½	....
De Bardeleben C. & I. Co	....	$76
Decat. L. Imp.	$14¼	$15½
Decatur Min. L.	....	$22¾
Ensley Land	$10	....
*Eureka	**$99½	....
Florence L. & Mg. Co	$20	$22
Gadsen Land	$6	$6¼
Hecla Coal Co.	$5	....
Hen. S. & M. Co	....	$80
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co	$20	....
Sheffield C. & I. Co	$55	$60
Sloss I. & S.	$44	....
†Sloss I. & S.	$95	$97
††Sloss I. & S.	....	$78
Tuscaloose C. I. & L. Co	$24	$27
Tenn. C. & I. Co.	....	$51
" pref.	$100	$105
Vulcan C. & C. Co	....	$5
Woodstock I. Co.	....	$40

Prices, highest and lowest, bid and asked during week ending July 14.

* Bonds. † First mortgage. †† Second mortgage. ** Without interest.

Pittsburg, Pa. July 23.

COMPANY.	B.	A.	Closing
Allegheny Gas Co.	....	....	....
Bridgewater Gas Co.	$56.00	$60.00	$60.00
Chartiers Val. Gas	....	41.00	....
Columbia Oil Co.	2.25	2.50	2.38
Consolidated Gas Co.	....	....	....
East End E. Light Co.	60.00	....	60.00
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.18	.20	....
Luster Mg. Co.	17.00	18.00	17.88
Manuf'turers Gas Co.	14.00	16.50	16.00
Nat. Gas Co. of W. Va	....	....	....
N. Y. & Clev. Gas Coal.	31.50	33.00	31.50
Ohio Valley Gas	11.00	30.00	12.00
Mansfield C. & C. Co.	....	....	....
Pennsylvania Gas	....	14.00	14.00
People's Natural Gas.	....	....	....
People's N. G. & P. Co.	15.63	15.75	15.75
Philadelphia Co.	*30.38	*30.38	*30.38
Pine Run Gas Co.	....	....	....
Pittsburg Gas	....	....	....
Silverton Mg. Co.	....	....	....
South Side Gas	....	....	....
Tuna Oil Co.	....	....	....
Union Gas	....	....	....
Washington Oil Co.	....	....	....
W'house Brake Co.	....	....	....
W'house A. B. Co.	116.00	118.50	118.50
W'house E. Light	36.00	38.88	36.38
W'moreland & Camb.	....	....	....
Wheeling Gas	18.63	20.00	19.75
Yankee Girl Mg	3.00	5.00	5.00

* Actual selling price.

Prices bid and asked and sales during week ending July 23:

Penn. Gas Co.	.. shs.	....
Philadelphia Co.	.. 25 "	@$30⅜
West Electric	.. 20 "	$37¾@$38

St. Louis. July 23.

CLOSING PRICES.

COMPANY.	Bid.	Asked.
Adams, Colo.	$1.10	$1.15
American & Nettie	1.85	92½
Aztec, N. Mex.	.08	....
Bi-Metallic	32.50	....
Buckskin	.05	....
Central Silver	.13½	.14
Cleveland, Colo.	.04½	.05
Cleveland & An'r.	.15	.17½
Coeur d'Alene	.87½	.95
Gold King	.02	....
Granite Mountain, Mont.	46.50	....
Hope, Mont.	2.00	2.30
Ivanhoe, Colo.	.08	.10
I. X. L., Colo.	.01½	.02
La Union	.09	.09½
Little Albert	.13¼	.32½
Montrose Placer, Colo.	.40	.42½
Major Budd, Mont.	.06½	.07
Mickey Breen	1.22½	1.27½
Mountain Key	.65	.67½
Pat Murphy, Colo.	.11½	.12
Richmond Hill	.12	.12½
Silver Age, Colo.	1.50	1.55
Small Hopes, Colo.	.85	.95
Tourtelotte	.04	.04½
West Granite, Mont.	1.05	1.10
Wire Patch	.16¼	.17½
Yuma, Ariz.	.40	....

Trust Stocks. July 25.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Tr. Repts.	$28½@$29	
Cattle Trust	14 @ 16	
Distillers' & Cattle Feeders'.	45 @ 45⅝	
Linseed Oil	49¾@ 50¼	
National Lead	21½@ 21⅝	
Standard Oil	165 @169	
Sugar Refineries.	77¾@ 77⅞	

Sales at the New York Stock Exchange week ending July 18:

	Sales.	Price H.	Price L.
*American Cotton Oil	330	29	28⅛
National Lead	22,345	21⅞	20¾
Sugar	224,375	79½	75¾

*Trust receipts.

Foreign Quotations.

London.

COMPANY.	Highest.	Lowest.
Almada, Mex.	1s. 6d.	1s.
Amador, Cal.	£15-16	£13-16
Appalachian, N. C.	9d.	6d.
Canadian Phos, Canada.	£⅛	£⅛
Carlisle, N. Mex	3s. 6d.	3s.
Colorado, Colo.	4s.	2s. 6d.
Comstock, Utah	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	2s. 3d.	1s. 9d.
Denver Gold, Colo.	9d.	3d.
Dickens Custer, Idaho.	1s. 6d.	1s.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela	£2	£1¾
Elmore, Idaho	2s. 3d.	1s. 9d.
Empire, Mont	1s. 3d.	9d.
Garfield, Nev.	1s. 9d.	1s. 3d.
Jay Hawk Mont	3s.	2s.
Josephine, Cal	1s. 6d.	1s.
Kohinoor, Colo.	2s. 3d	1s. 9d.
La Luz, Mex.	1s.	6d.
La Valera, Mexico	17s. 6d.	12s. 6d.
Montana Lt., Mont	25s.	24s.
New California, Colo.	7s. 6d.	7s.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 3d.	9d.
New Emma, S., Utah	1s. 6d.	1s.
New Flagstaff, Utah	3s. 3d.	2s. 9d.
Newfoundland, N. F.	3s. 6d.	3d.
N. Gold Hill, N. C.	1s 6d.	1s.
New Guston, Colo.	£4½	£4¼
New Hoover Hill, N. C.	1s. 3d.	9d.
Old Lout, Colo.	£¾	£⅝
Palmarejo, Mex	15s 3d.	14s. 9d.
Pinos Altos, Mex	£⅝	£½
Pitsburg Cons., Nev.	£1-16	£¼
Richmond Con., Nev.	£1	£¾
Ruby & Dunderberg, Nev	1s.	9d.
Sam Christan, N. C.	1s. 3d.	9d.
Sierra Buttes, Cal.	4s.	3s.
" Plumas Eur.	£15-16	£13-16
Sonora Mex	1s.	6d.
United Mexican, Mex.	7s.	6s.
U. S. Placer, Colo.	2s. 3d.	1s. 9d.
Viola Lt., Idaho	2s.	1s. 6d.

Highest and lowest prices during the week ending July 12.

Paris.

	Francs.
Belmez, Spain	725.00
Callao, Venez.	56 75
Callao Bis, Venez.	6.50
East Oregon, Ore.	7.50
Forest Hill Divide, Cal.	100.00
Golden River, Cal	440.00
" " parts	65.00
Lexington, Mont.	132.00
" parts	4.00
Rio Tinto, Spain	586.25
Tharsis, Spain	146 25

CURRENT PRICES.

These quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs.	$1.75@$2.00
Muriatic, 18°, ℔ 100 lbs	1.00@1.50
Muriatic, 20° ℔ 100 lbs.	1.12½@1.75
Muriatic, 22° ℔ 100 lbs.	1.37½@2.00
Nitric, 36°, ℔ 100 lbs.	4.00@4.25
Nitric, 42°, ℔ 100 lbs.	6.00@6.25
Oxalic, ℔ 100 lbs.	6.50@10.50
Sulphuric, 60°, ℔ 100 lbs.	.80@1.25
Sulphuric, 66°, ℔ 100 lbs.	1.00@1.75
Alkali—	
Refined, 48 p. c.	@2¾
Refined. 58°	2¾@3
Alum—Lump, ℔ lb.	1¾
Ground, ℔ lb.	1¾@2
Lump, ℔ ton, Liverpool	£4 17 6
Sulphate of Alumina, ℔ ton	£4 10
Aqua Ammonia—18°, ℔ ℔	4¾
20°, ℔ ℔	6
22°, ℔ ℔	6@7
26°, ℔ ℔	10@11
Ammonia—Sul., ℔ 100 lbs.	3.15
Carb., per lb	7½@8½
Arsenic—White, powdered, ℔ lb.	3¼@3½
Red, ℔ lb.	5¾@6¾
White, at Plymouth, ℔ ton	£12 2 6d.
Asbestos—Am., p. ton	$50@$300
Italian, p. ton, c. i. f. L'pool	£18@£60
Asphaltum—P. ton	13.00
Prime Cuban, ℔ ℔	4½@5½c
Hard Cuban, ℔ ton	$28.00
Trinidad, refined, ℔ ton	$30.00
Barytes—Sulph., Am. prime white	17@20
Sulph., foreign, fitted, p. ton	19½@21.50
Sulph., off color, p. ton	11.50@14.00
Carb., lump, f. o. b. L'pool, ton	£6
No. 1, casks, Runcorn "	£4 10 0
No 2, bags, Runcorn "	3 15 0
Bleach—Over 35 p.c., ℔ lb.	2@2½
Borax—Refined, ℔ lb.	9½@10⅝
Concentrated	7¾@8⅜
Refined at Liverpool, ℔ ton	£29
Brimstone—*See Sulphur.*	
Bromine—℔ lb.	37@38
Chalk—℔ ton	1.75
Precipitated, ℔ lb.	4¾@5
China Clay—English, ℔ ton	13.50@18.50
Southern, ℔ ton	13.50
Chrome Yellow—℔ lb.	10@25
Cobalt—Oxide, ℔ lb.	2.60@2.90
Copper—Sulph. English Wks, ton	£20@£21
Copperas—Common, ℔ 100 lbs.	70
Best, ℔ 100 lbs.	75@1.00
Liverpool, ℔ ton, in casks	£1 15s.
Cream of Tartar—Am. 99%	22½
Powdered, 99 p. c.	23
Emery—Grain, ℔ lb.	4½@5
Flour, ℔ lb	2¾@3½
Feldspar—Ground, ℔ ton	15.00
Fuller's Earth—Lump, ℔ bbl.	.90@95
Powdered, ℔ lb.	1½@2
Gypsum—Calcined, ℔ bbl.	1.25@1.50
Iodine—Resublimed	2.75
Kainit—℔ ton	$9.25@$9.75
Kaolin—*See China Clay.*	
Lead—Red, ℔ lb.	6¾@9
White, American, in oil, ℔ lb.	6¾@7¼
White, English, ℔ lb	8½@8¾
Acetate, or sugar of, white	12@13
Lime Acetate—Amer. Brown	.95@1.00
" Gray	1.75@1.87½
Litharge—Powdered, ℔ lb.	6½@6¾
English flake, ℔ lb.	9@9½
Magnesite—Greek, ℔ ton	20.00
Manganese—Crude, per unit	.23@.28
Oxide, ground, per lb	2½@6½
Mercuric-Chloride—(*Corrosive Sublimate*), ℔ lb.	70@72
Mineral Wool—℔ lb.	2
Mica—In sheets according to size.	
1st quality, ℔ ℔	25@$6.00
Ochre—Yellow, "B. F.," ℔ ton, f.o.b. mill	30.00
"J. F. L. S.," ℔ lb. ex dock	2½
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston	5.75@7.00
Ground, ex vessel New York.	11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton	16.00
Phosphorus—℔ lb.	70@75
Plumbago—Ceylon, ℔ lb.	4@5
American, ℔ lb.	5@7
Potassium—Cyanide, ℔ lb.	39@40
Bromide, ℔ lb.	33
Chlorate, ℔ lb.	13@10
Carb. ℔ lb.	4.70@5.54
Caustic, ℔ lb.	7½@8
Iodide	2.65@2.70
Muriate, ℔ 100 lbs.	1.77½@1.80
Nitrate, refined, ℔ lb.	6@8
Bichromate, ℔ lb	10½@11
Sulphate, ℔ 100 lbs.	2.30@2.35
Yellow Prussiate, ℔ lb.	17½@18
Red Prussiate, ℔ lb.	42@45
Pumice Stone—Select lumps, lb.	3¼
Original cks., ℔ lb.	1¾@2
Powdered, pure, ℔ lb.	2¼@2½
Pyrites—Non-cupreous, p. units	10d
Quartz—Ground, ℔ ton.	14.00@16.00
Rotten Stone—Powdered, ℔ lb.	3¼@3½
Lump, ℔ lb	6@10
Salt—Liverpool, ground ℔ sack	75@80
Turk's Island, ℔ bush.	.25@28
Salt Cake—℔ lb.	60@62½
Saltpeter—Crude, ℔ lb.	5¼@5½
Refined. ℔ lb.	6@8
Soda Ash—Carb., 48% 100 ℔	2¾
Caustic, 48 %	2¼@2½
Soda Caustic, 60%	3.25@3.35
" 70%	3.00
" 74-76%	2⅞
Sal, English, ℔ 100 lbs.	1½@1⅝
Sal, American, ℔ 100 lbs	.90
Nitrate, 100 lbs.	1.70
Strontium—Nitrate ℔ lb.	9@9½
Sulphur—Roll, ℔ lb.	1¾
Flour, ℔ lb.	2@
Crude Brimstone, 2s., ℔ ton.	19.00@19.29
Crude Brimstone, 3ds, ℔ ton.	18.50@18.70
Talc—Ground French, ℔ lb.	1¼@1½
Domestic, ℔ ton	$18@$20
c. i. f. Liverpool, ℔ ton	£4 5
Vermillion—American, ℔ lb.	61
English, ℔ lb.	82@85
Vitriol—(Blue), Ordinary, ℔ lb.	5½@5⅝
Extra, ℔ lb.	7
Zinc Oxide—Am., Dry, ℔ lb.	4½
Antwerp, Red Seal, ℔ lb.	6@6½
Paris, Red Seal, ℔ lb.	6½@7

* Spot.

THE RARER METALS.

Aluminum—(Metallic), ℔ lb.	$2.@$2.50
Sheet, per lb.	2.50
Arsenic—(Metallic), per lb.	.40
Barium—(Metallic), per gram.	$4.00
Bismuth—(Metallic), per lb.	2.75
Cadmium—(Metallic), per lb.	1.00
Calcium—(Metallic), per gram	10.00
Cerium—(Metallic), per gram	7.50
Chromium—(Metallic), per gram	1.00
Cobalt—(Metallic), per lb.	6.00
Didymium—(Metallic), per gram	9.00
Erbium—(Metallic), per gram.	7.50
Gallium—(Metallic), per gram	140.00
Glucinum—(Metallic) per gram.	12.00
Indium—(Metallic), per gram.	9.00
Iridium—(Metallic), per oz.	7.00
Lanthanum—(Metallic), per gr.	10.00
Lithium—(Metallic), per gram.	10.00
Magnesium—Per lb.	4.50
Manganese—Metallic, per lb.	1.10
Chem. pure, per oz.	10.00
Molybdenum—(Metallic), per gm.	.50
Niobium—(Metallic), per gram.	5.00
Osmium—(Metallic), per oz	65.00
Palladium—(Metallic), per oz.	35.00
Platinum—(Metallic), per oz.	9.00
Potassium—Metallic, per lb.	28.00
Rhodium—(Metallic), per gram.	5.00
Ruthenium—(Metallic), per gm.	5.50
Rubidium—(Metallic), per gram	2.00
Selenium—(Metallic), per oz.	1.80
Sodium—(Metallic) per lb.	2.50
Strontium—(Metallic), per gm.	.60
Tantalum—(Metallic) per gram	9.00
Telurium—(Metallic) per lb.	5.00
Thallium—(Metallic) per gram.	.25
Titanium—(Metallic) per gram.	2.25
Thorium—(Metallic) per gram.	17.00
Tungsten—(Metallic) per oz.	2.25
Uranium—(Metallic), per lb.	5.00
Vanadium—(Metallic), per gm.	22.00
Yttrium—(Metallic), per gram.	9.00
Zirconium—(Metallic), per oz.	65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000	3.50@3.75
Jerseys, ℔ 1,000	5.50@7.00
Up Rivers, ℔ 1000	6 75@7.00
Haverstraw seconds, ℔ 1000	6.50@7.00
Haverstraw firsts. ℔ 1,000	7.00@7.75
Fronts, nominal, ℔ 1000.	
Croton	14.00@16.00
Wilmington	20.00@21.00
Philadelphia	@22.00
Trenton	@22.00
Baltimore	
Building Stone—Amherst freestone, ℔ cu. ft.	95@1.00
Brownstone, ℔ cu. ft.	1.00@1.35
Granite, rough, ℔ cu. ft.	45@1.25
Granite, Scotch ℔ cu. ft.	1.00@1.15
Cement—Rosendale, ℔ bbl	.85@1.10
Portland, American, ℔ bbl.	2.15@2.45
Portland, foreign, ℔ bbl.	2.30@2.40
Portland, " special brands.	2.45@2.75
Roman, ℔ bbl.	2.65@2.85
Keene's coarse, ℔ bbl.	4.50@5.50
Keene's fine, ℔ bbl.	7.00@8.25
Slate—Purple and green roofing, ℔ 100 ft.	7.00@7.50
Red roofing, ℔ 100 sq. ft.	12.00
Black, roofing, ℔ 100 sq. ft.	4.25@5.50
Lime—Rockland, common ℔ bbl.	1.00
Rockland, finishing, ℔ bbl.	1.20
St. John, com. and finish, ℔ bbl.	.90@.95
Glens Falls, com. and fin., ℔ bbl.	.85@1.10
Labor—Ordinary, ℔ day	1.50@2.00
Masons, ℔ day	4.00
Plasterers, ℔ day	4.00
Carpenters, ℔ day	3.50
Plumbers, ℔ day	3.50
Painters, ℔ day	2.50@3.50
Stonesetters, ℔ day	3.50@4.00
Tilelayers, ℔ day	3.50@4.50
Bricklayers, ℔ day	4.00

THE ENGINEERING AND MINING JOURNAL will thank any one who will indicate any other articles which might with advantage be quoted in these tables or who will correct any errors which may be found in these quotations.